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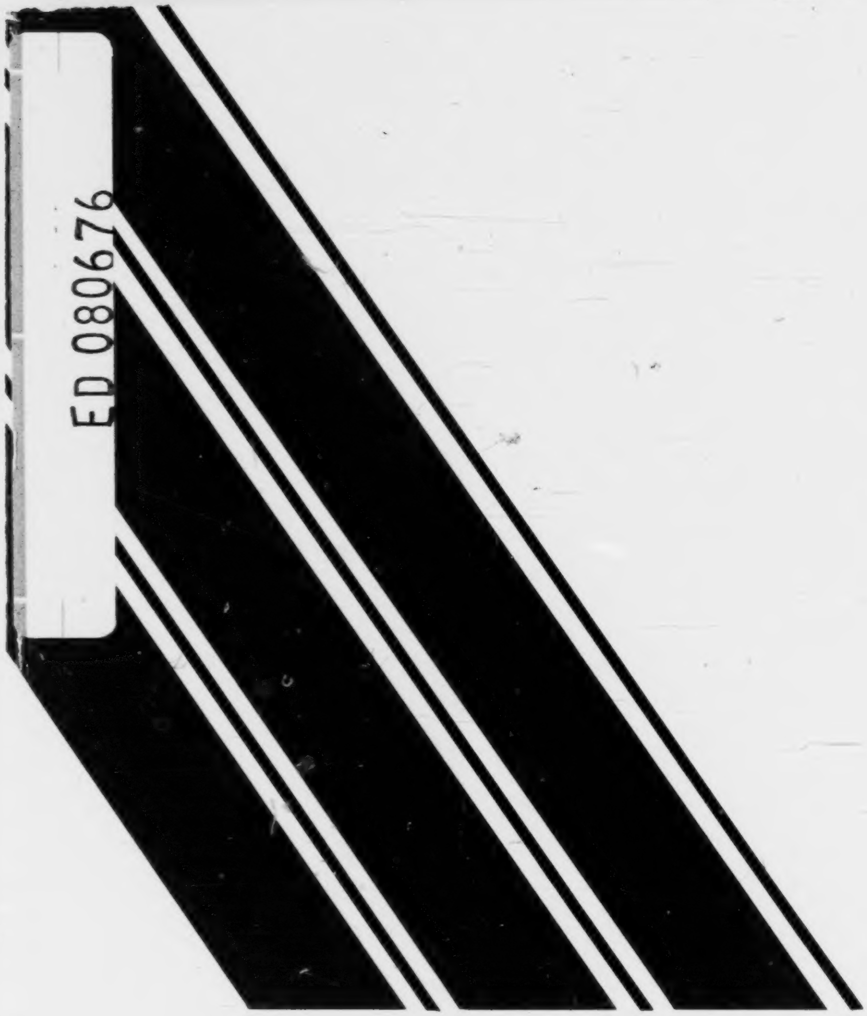
ABSTRACT

The eight projects of the 1971-1972 operations of the Institute are described in this first annual report. Scientists from Missouri, Kansas, Iowa, and Nebraska have designed and developed each project, working on a performance contract basis to facilitate and improve the quality of the application of educational technology. Each project is described separately with its purpose, methodology, procedures, and results. The projects range over a wide area of interest and include: (1) Conferences of State and Regional Education Officials, (2) Demonstration School Project Development, (3) Vocational Materials Preparation, (4) Preparation of Curricular Materials for Training of Vocational Technical Teachers, (5) Media Institute Materials Preparation, (6) Conference on Evaluation Model, (7) Self-Instructional Career Guidance System Model, and (8) Reading Center Development. (MU)



ED 080676

ANNUAL REPORT

INSTITUTE FOR EDUCATION AND TECHNOLOGY

JUNE, 1972

Prepared by: edutek incorporated

Ninth and Avenue H
1340 Air Park West
Lincoln, Nebraska 68524

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ANNUAL REPORT

JULY 1, 1971 - JUNE 30, 1972

edutek
incorporated
INSTITUTE FOR
EDUCATION AND
TECHNOLOGY

Ninth and Avenue H
1340 Air Park West
Lincoln, Nebraska 68524

The work reported herein was performed pursuant to a contract with the United States Department of Health, Education, and Welfare, Office of Education.

FOREWORD

EDUTEK, Inc. was formed for the purpose of expanding the application of technology to the critical opportunities in education by organizing and coordinating the resources of educational and governmental ~~agencies~~ agencies, business, and industry in the establishment of a regional Institute for Education and Technology, to be headquartered in Lincoln, Nebraska.

This report marks the end of the first year of operational activity for the Institute. It indicates that the organization is viable and that overall objectives are being achieved through separate, yet interlocking components. The United States Office of Education's effort to consolidate funding, objectives, activities, reporting and product dissemination (exemplified by the first-of-a-kind contract from eight USOE agencies to fund the Institute) can now be viewed as a successful effort to facilitate and improve the quality of the application of technology to educational opportunities.

Combined with the USOE contract, EDUTEK management engaged scientists from four states of Missouri, Kansas, Iowa, and Nebraska to design and execute the development and operational functions of each project. These investigators, all respected people with specific expertise in the program area, work on a performance contract basis rather than as consultants. They remain full-time employees of their respective institutions and devote the number of days permitted by administrative policies to the work of the Institute. This concept has helped overcome the traditional educational resistance to change by involving the "establishment" in bringing about change. The "regional staff" concept has also given the Institute a great deal of regional as well as national visibility.

Even with only a year of development, it seems assured that the consolidation of funds from USOE and the consolidation and management of human and non-human resources on a regional basis assign a significant responsibility in mid-America, to the Institute for Education and Technology and to EDUTEK, Inc.

Wm. L. Stucker

Wm. L. Stucker
President of EDUTEK
Director of the Institute

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PROJECT 1

CONFERENCE OF STATE AND REGIONAL EDUCATION OFFICIALS

PROJECT PERIOD
July 1, 1971 - June 30, 1972

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TECHNOLOGY

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USOE Contract No.: OEC-0-71-1253
EDUTEK, Inc.

PROJECT #1

ANNUAL REPORT

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I. PURPOSE:

Because of the unique relationship of the Institute for Education and Technology to public and private elementary, secondary and post-secondary institutions and programs in the states of Iowa, Kansas, Missouri and Nebraska and the unique role of the Institute in relation to the USOE Region VII office staff and various state departments staffs, it is necessary to establish liaison through the first year's activities and to promulgate improved communications between and among the various agencies in the four-state region.

Since the Institute is a newly established organization, it lacks working agreements, lines of communication with the above-mentioned groups, and mutual understanding of the Institute's functions and purposes. For this reason it was essential to the future operations of the Institute to establish communication with the educational leadership of the four-state area specifically and educational leaders nationally who have a great deal of influence upon local educational institutions.

II. PROCEDURES:

Lines of communication have been established through frequent informal and formal meetings with individuals representing the following institutions and agencies:

A. State Departments of Education

1. Nebraska

   a. Dr. Cecil Stanley, Commissioner of Education
   Nebraska State Department of Education
   Lincoln, Nebraska

   b. Mr. Glenn Strain, Assistant Commissioner of Vocational Education
   Nebraska State Department of Education
   Lincoln, Nebraska

   c. Mr. Lloyd Mather
   Nebraska State Department of Education
   Technical and Industrial Education
   Lincoln, Nebraska

d. Mr. Glen Shaffer
Nebraska State Department of Education
Lincoln, Nebraska

e. Mr. Jack Baille
Director, Title III
Nebraska State Department of Education
Lincoln, Nebraska

2. Iowa

a. Mr. George N. Lawry, Consultant
Career Education Division, Area Schools and
Career Education Branch
Iowa Department of Public Instruction
Des Moines, Iowa

b. Mr. Robert Benton
State Superintendent of Instruction
Council Bluffs, Iowa

3. Kansas

4. Missouri

a. Dr. Arthur Mallory, Commissioner
State Department of Education
Jefferson Building
Jefferson City, Missouri

b. Mr. Bill Gann
Director of Adult Education
State Department of Education
312 Capitol Avenue
Jefferson City, Missouri

B. Public Schools

1. Nebraska

a. Mr. Robert Reier
Counselor Student Employment
Lincoln Public Schools
Lincoln, Nebraska

b. Dr. Jim Sanders
Director of Research
Lincoln Public Schools
Lincoln, Nebraska

c. Mr. Jack Elliott
   Superintendent of Schools
   North Platte, Nebraska

d. Mr. John Prasch
   Superintendent of Schools
   Lincoln, Nebraska

e. Mr. Dale Siefkas
   Superintendent of Schools
   Waverly, Nebraska

2. Iowa

   a. Mr. Dwight Davis
      Superintendent of Schools
      Des Moines, Iowa

3. Kansas

   a. Mr. Merle Bolton
      Superintendent of Schools
      Topeka, Kansas

   b. Dr. Frank T. Jacobs, Executive Director of
      Kansas Council of Vocational Education
      Topeka, Kansas

   c. Mr. Arzell Ball
      Superintendent of Schools
      Shawnee Mission, Kansas

4. Missouri

   a. Mr. Joe Herndon
      Superintendent of Schools
      Raytown, Missouri

   b. Mr. Ruie Dullin
      Superintendent of Schools
      North Kansas City, Missouri

   c. Dr. D. A. Kohn, Superintendent
      Central School System
      Flat River, Missouri

C. Technical/Community Colleges

   1. Nebraska

a. Dr. Robert Schleiger, Executive Director
Nebraska Board of Technical and Community Colleges
Lincoln, Nebraska

b. Dr. Donald Andrews, Dean of Instruction
Omaha Technical Community College
Omaha, Nebraska

c. Dr. Chester Gausman, President
Central Nebraska Technical Community College
Hastings, Nebraska

d. Dr. James E. Lightbody, Assistant Superintendent
Lincoln Nebraska Technical Community College
Lincoln, Nebraska

e. Mr. Don Klosterman
Lincoln Technical College
Lincoln, Nebraska

f. Mr. Wayne H. Wheeler, Supervisor
Trade and Industrial Education Division
Lincoln Nebraska Technical Community College
Lincoln, Nebraska

2. Iowa

a. Mr. Bob Crowley, Dean of Instruction
Hawkeye Institute of Technology
Waterloo, Iowa

b. Dr. Vernon Pickett
Associate Superintendent of Education
Kirkwood Community College
Cedar Rapids, Iowa

3. Kansas

a. Mr. Dave Adams, Department Chairman
Area Vocational Technical School
Wichita, Kansas

b. Mr. Thomas F. Creech, Dean of Instruction
Kansas Technical Institute
Salina, Kansas

4. Missouri

a. Dr. Donald Welsh, Director
Occupational Programs and Research Services
Metropolitan Community College
Kansas City, Missouri

        b. Mr. Donald Simmons, Dean of Technical Education
           Springfield Area Vocational Technical School
           Springfield, Missouri

D. Four Year Colleges

   1. Nebraska

      a. Dr. Larry Andrews
         Assistant Professor of Secondary Education
         University of Nebraska-Lincoln
         Lincoln, Nebraska

      b. Mr. James A. Bikkie, Assistant Professor
         Business Teacher Education
         University of Nebraska-Lincoln
         Lincoln, Nebraska

      c. Dr. Hazel Crain, Associate Professor
         Education and Family Resources
         University of Nebraska-Lincoln
         Lincoln, Nebraska

      d. Dr. Roy D. Dillon, Professor
         Agricultural Education
         University of Nebraska-Lincoln
         Lincoln, Nebraska

      e. Dr. Richard L. Douglass, Assistant Professor
         Agricultural Education
         University of Nebraska-Lincoln
         Lincoln, Nebraska

      f. Dr. Steven A. Eggland, Co-Director
         Mediated Cooperative Teacher Education Program
         University of Nebraska-Lincoln
         Lincoln, Nebraska

      g. Dr. Robert Filbeck, Professor
         Educational Psychology and Measurements
         University of Nebraska-Lincoln
         Lincoln, Nebraska

      h. Dr. James T. Horner, Professor and Chairman
         Department of Agricultural Education
         University of Nebraska-Lincoln
         Lincoln, Nebraska

      i. Mr. M. G. McCreight, Associate Professor
         Agricultural Education
         University of Nebraska-Lincoln
         Lincoln, Nebraska

j. Dr. Wesley C. Meierhenry, Professor and Chairman
Department of Adult and Continuing Education
University of Nebraska-Lincoln
Lincoln, Nebraska

k. Dr. Robert W. Mills, Assistant Professor
Industrial Arts
University of Nebraska-Lincoln
Lincoln, Nebraska

l. Dr. Roland L. Peterson, Assistant Professor
Agricultural Education
University of Nebraska-Lincoln
Lincoln, Nebraska

m. Dr. Frank E. Sorenson, Coordinator
Aerospace Education Division
University of Nebraska-Lincoln
Lincoln, Nebraska

n. Mr. U. E. Wendorff, Associate Professor
Agricultural Engineering and Agricultural Education
University of Nebraska-Lincoln
Lincoln, Nebraska

o. Dr. Dale G. Zikmund, Co-Director
Mediated Cooperative Teacher Education Project
Assistant Professor of Agricultural Education
University of Nebraska-Lincoln
Lincoln, Nebraska

2. Iowa

a. Mrs. Lida M. Cochran
Professor of Education
University of Iowa
Iowa City, Iowa

b. Dr. William Oglesby, Director
Audio Visual Resources
University of Iowa
Iowa City, Iowa

3. Kansas

a. Dr. Sam Keyes
Dean of Education
Kansas State University
Manhattan, Kansas

4. Missouri

a. Dr. John Elias, Coordinator of Distributive Education
Teacher's Education Department
University of Missouri-Columbia
Columbia, Missouri

b. Mr. G. Dean Fitzgerald
University Wide Extension
University of Missouri-Columbia
Columbia, Missouri

c. Dr. Bart Griffith
Office of Instructional Resources
University of Missouri-Columbia
Columbia, Missouri

d. Dr. Merlyn Herrick
Assistant to the Dean
University of Missouri-Columbia
Columbia, Missouri

e. Mr. Howard Hulen, Assistant Director
Medical Computer Center
University of Missouri-Columbia
Columbia, Missouri

f. Dr. Franklin J. King
Coordinator of Industrial Education
University of Missouri-Columbia
Columbia, Missouri

g. Dr. F. Milton Miller
Assistant Professor of Industrial Education
University of Missouri-Columbia
Columbia, Missouri

h. Dr. Wilbur R. Miller, Professor and Chairman
Department of Industrial Education
University of Missouri-Columbia
Columbia, Missouri

i. Dr. John K. Sherk, Jr., Director
Reading Center
University of Missouri-Kansas City
Kansas City, Missouri

E. Others

1. Nebraska

a. Mr. Harlan M. Heald
Associate Executive Director
Nebraska Hospital Association
Lincoln, Nebraska

- b. Capt. Stanley Heng, Jr.
  Nebraska Military Department
  Lincoln, Nebraska

- c. Mr. Jack Stiles, Director
  St. Elizabeth Community Health Center
  Lincoln, Nebraska

- d. Mrs. Virginia Vieregg, Chairman
  Nebraska Council Vocational Education
  Grand Island, Nebraska

- e. Lt. Elton Edwards
  Nebraska Military Department
  Lincoln, Nebraska

- f. Dr. C. A. Cromer, Executive Director
  Nebraska Council of Vocational Education
  University of Nebraska-Lincoln
  Lincoln, Nebraska

- g. Mr. Richard Bringelson
  Consultant, Northern Systems
  Lincoln, Nebraska

- h. Mr. Gerald E. Chizek, Commissioner of Labor
  Nebraska State Department of Labor
  Lincoln, Nebraska

- i. General Don Penterman
  Nebraska National Guard
  Lincoln, Nebraska

2. Iowa

   - a. Mr. James T. Klein, Chairman
     Employment Security Commission
     Des Moines, Iowa

   - b. Mr. James Walker
     John Deere Production Engineer
     Waterloo, Iowa

   - c. Mr. Bob Ware, Personnel Director
     Zenith Radio Corporation of Missouri
     Springfield, Missouri

3. Kansas

4. Missouri

   a. Mr. Gordon R. Kutscher, Executive Secretary
      Missouri Advisory Council on Vocational Education
      Jefferson City, Missouri

   b. Mr. Dick Baker, Manager of Information Systems
      Chemagro Corporation
      Kansas City, Missouri

F. USOE Region VII Office, Kansas City, Missouri

1. Dr. Phillip Hefley, Regional Commissioner
   Office of Education, Department of Health,
   Education and Welfare
   Region VII
   Kansas City, Missouri

2. Dr. Billy Reagan, Former Commissioner
   Office of Education, Department of Health,
   Education and Welfare
   Region VII
   Kansas City, Missouri

3. Mr. Denny Stephens, Library Services Program Officer
   Office of Education, Department of Health, Education
   and Welfare, Region VII
   Kansas City, Missouri

4. Mr. Thane McCormick, Director, AVTE, Department of
   Health, Education and Welfare, Region VII
   Kansas City, Missouri

5. Ms. Christine Northern, Information Specialist,
   Office of Education, Department of Health, Education
   and Welfare, Region VII
   Kansas City, Missouri

G. Educational leaders contacted outside the four-state area include:

1. Dr. Jack Edling
   Center for Advance Study of Technology, U.S.I.U.
   San Diego, California

2. Dr. Floyd Urbach
   Technical Applications Project
   United States International University
   Corvallis, Oregon

3. Dr. Frank Nelson
   United States International University
   Corvallis, Oregon

4. Mr. Joseph Becker
   Becker & Hayes Inc.
   Bethesda, Maryland

5. Mr. Ken Oberholtzer
   Former Superintendent of Schools
   Denver, Colorado

6. Dr. George Bair, Director
   North Carolina Educational Television Network
   University of North Carolina
   Chapel Hill, North Carolina

7. Dr. James Beaird, Director
   Teaching Research Division of the
   Oregon State System of Higher Education
   Monmouth, Oregon

8. Dr. Bud Paulson
   Teaching Research Division of the
   Oregon State System of Higher Education
   Monmouth, Oregon

9. Dr. Donald Ely
   Syracuse University
   Syracuse, New York

10. Dr. Dennis Gooler
    Syracuse University
    Syracuse, New York

11. Dr. Charles Schuller
    Michigan State University
    East Lansing, Michigan

12. Dr. William Allen
    University of Southern California
    Los Angeles, California

13. Ferucio Freschet
    New England Resource Center
    for Occupational Education
    Newton, Massachusetts

14. Al Stohler
    Northwest Regional Laboratory
    Portland, Oregon

15. Douglas Towne
    Northwest Regional Laboratory
    Portland, Oregon

16. Dr. Neil C. Aslin, President
North Central Association of Colleges
and Secondary Schools
University of Missouri
Columbia, Missouri

In addition to the relationships established with the aforementioned personnel, conferences with representatives of the following agencies were held during the past year:

1. North Central Association of Colleges and Secondary Schools
2. Mid-America State Universities Association
3. Adult Education Division -- Nebraska State Department of Education
4. Adult Education Division -- Missouri State Department of Education
5. Lincoln, Nebraska, Technical and Community College
6. University of Nebraska
7. Midwest Regional Media Center for the Deaf
8. USOE Regional Office -- Kansas City
9. Comprehensive Health Planning -- State of Nebraska
10. USOE Commissioner's office
11. Danforth Foundation
12. Great Plains National Instructional Television Library
13. Federal Aviation Administration
14. Southeast Nebraska Health Planning Council
15. University of Missouri -- Columbia Medical Center
16. Nebraska State Department of Education
17. College of Education, Kansas State University
18. College of Education, Wichita State University
19. Chancellor, University of Missouri, Columbia, Missouri
20. Chancellor, University of Missouri, Kansas City, Missouri
21. National Aeronautics and Space Administration

Materials descriptive of EDUTEK and the Institute were disseminated to the educational leadership interested in EDUTEK and the Institute.

A brochure (Appendix A) has been prepared and distributed nationally describing EDUTEK and the Institute for Education and Technology.

A slide tape presentation is presently being scripted and developed which will be a free-standing presentation describing:

I. Definition of EDUTEK.
II. Definition of the Institute for Education and Technology.
III. Definition of the relationship between EDUTEK, the Institute, and elementary, secondary, post-secondary, and higher education institutions.
IV. Administration, operation, and organization of EDUTEK and the Institute.

V. Overview of the nature of problems to which EDUTEK and the Institute are addressed.
VI. EDUTEK's role in the solution of educational problems.
VII. New strategies developed by EDUTEK to solve educational problems.

An informal network of superintendents of schools from the four-state region has been established and through this network the superintendents are identifying the needs of their districts and seeking (through the Institute) special programs which fill those needs. Members of this network include representative superintendents, Title III coordinators and representatives from the State Commissioner's offices. Presently this network is just getting underway; the network actually began functioning the first week of June. It is presently anticipated that this network will expand and continue functioning (through the Institute) in a manner which will allow free communications among network members looking for ways to solve educational problems within their own areas.

A conference to develop and critique a model for adoption of innovations throughout the four-state area has been held (see Project #2 Annual Report) during which a great deal of interest was stimulated concerning widespread adoption of innovative programs in the four-state area.

Also during this conference a set of guidelines to be used in the writing of Title III proposals and management of those programs once implemented was discussed, critiqued and participants are interested in refining and using these guidelines (see Project #2 Annual Report, Appendix A).

A conference to develop an evaluation model for existing and future vocational educational programs was also held, during which a network of educators interested in solving many of the problems presently affecting vocational education problems was started. This network is also off to a healthy beginning and shows potential in the area of identifying and systematically overcoming (through the Institute) many vocational education problems (see Project #6 Annual Report for the details).

Other needs of the four-state area which have been identified or refined and for which programs have been planned and implemented to varying degrees are:

a) the need for the preparation of vocational materials (see Project #3 Annual Report);
b) the need for the preparation of curricular materials for the training of vocational-technical teachers (see Project #4 Annual Report);

c) the need for a self-instructional guidance system model (see Project #7 Annual Report); and,
d) the need for the development of a reading center (see Project #8 Annual Report).

Further definitions of these needs has been made during the past months, and action oriented programs have been designed, planned and implemented which will fulfill the identified needs within the four-state region.

A strategy to maintain ongoing, cooperative projects with individuals and institutions within the Institute's region has been developed through the concept of "shared help", and through the above-mentioned communications networks.

Through the use of the shared help concept, the Institute maintains contact with many institutions throughout the four-state area. The advantages of this concept are many, i.e., the Institute is constantly updated on everything relevant to Institute projects; Institute projects receive widespread dissemination during the full project period. These advantages combine to make reciprocity among personnel and institutions a working reality.

The aforementioned communication networks serve this objective by establishing and maintaining constant communications and feedback among the members of those networks. As delivery systems for information originating and dispersing from these networks are further established, it is forecast that cooperation among the many school districts, education institutions and personnel will continue to grow.

III. RESULTS:

The results of this project have exceeded what was originally hoped for. Working agreements are being developed with a number of institutions within the Institute's four-state region. These have been generated because of the communication lines established through this project.

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Appendix A

"What is EDUTEK, Inc.?"

- A Private not-for-profit corporation of the State of Nebraska.
- Established through the assistance of the business and educational leadership of Nebraska.

"What is the Institute for Education and Technology?

- An operational program of EDUTEK, Inc.
- Established through the cooperation of the United States Office of Education, and the Nebraska State Department of Education, the Lincoln Public Schools, EDUTEK, and the University of Nebraska to facilitate and improve the quality of the application of technology to educational problems.

"In what way is EDUTEK, Inc., contributing to the solution of educational problems?"

- Through the DESIGN, DEVELOPMENT, DEMONSTRATION, and DISSEMINATION of systems that apply new technological innovations to the educational problems of today and tomorrow.

"In what type of projects is EDUTEK, Inc., engaged?"

- Self-Instructional Programs.
- Reading Development.
- Demonstration Schools.
- Vocational-Technical Education.
- Instructional Media.
- Evaluation Models.

"Are the activities of EDUTEK, Inc., limited to these areas?"

- No.
- EDUTEK is interested in the application of technology to educational problems of all kinds.

"How is the Institute funded?"

- Lincoln Chamber Industrial Development Commission.
- Government contracts.
- Government grants.
- Private foundation support.
- Management contracts.

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The Officers of EDUTEK, Inc.:

William L. Stucker	*President*
Wesley C. Meierhenry	*Vice President & Principal Scientist*
Ronald J. Turner	*Vice President*
Duane Vicary	*Treasurer*
Janet E. Lyons	*Secretary*

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page 23

PROJECT 2

DEMONSTRATION SCHOOL PROJECT DEVELOPMENT

PROJECT PERIOD
July 1, 1971 - June 30, 1972

PROJECT INVESTIGATOR
J. B. Johnson

edutek
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INSTITUTE FOR
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TECHNOLOGY

Ninth and Avenue H
1340 Air Park West
Lincoln, Nebraska 68524

USOE Contract No.: OEC-0-71-1253
EDUTEK, Inc.

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PROJECT #2

ANNUAL REPORT

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I. Purpose:

The purpose of Project #2 is to facilitate diffusion of innovation in the public schools of Kansas, Iowa, Missouri, and Nebraska.

II. Objectives:

A. To develop an installation model designed to insure the success of Title III programs and facilitate diffusion of those programs.

B. To identify and begin formulation of a consortium of schools to utilize the model (see objectve A) to diffuse Title III programs.

C. To establish a communication network including several Public School Superintendents, the Nebraska Title III coordinator and EDUTEK personnel.

III. Methodology:

Communication with the Nebraska Title III coordinator was immediately begun; from him the names of Title III project directors throughout Nebraska were obtained. Communications with the state Education Departments of the other three states were then established.

An installation model was then designed in two parts: a) Title III Guidelines which attempt to set forth generalizable guidelines which, when followed, will insure success in proposal writing, project management, and project evaluation; and b) the installation model itself.

Once this model had been designed, a conference attended by superintendents of public schools in the four-state area was held to test the feasibility of the model. Comments and critiques of the model were solicited. These comments and critiques will be used to revise the model during the next fiscal year.

IV. Findings:

A. The installation model is attached as Appendix A.

B. An informal agreement among the participants of the conference to critique the model has established a consortium. Interest in expanding and continuing this consortium has been shown, and only awaits further funding to fulfill these needs.

C. Accomplishment of "B" also accomplished this objective.

D. Critiques of the model (see Appendix A) have been attached as Appendix B.

V. Conclusions:

A. The developed model fills a gap between a demonstration school and an adopting school. This model follows the lines of a producer-consumer school model highly advocated by the U. S. Office of Education. This model also received favorable reactions from those who reviewed it, and a willingness to "try the model out" was exhibited by those public school people.

B. A four-state consortium of public school superintendents is possible, feasible and desired by those school personnel for the purpose of innovation dissemination/diffusion.

C. This project shows great potential for establishing a model for innovation diffusion based on the producer-consumer model and deserves to be validated during the next year.

APPENDIX A

TITLE III GUIDELINES CHECKLIST
and
INSTALLATION MODEL

by John B. Johnson

INTRODUCTION

The primary objectives of Project 2 are to develop an installation model designed to insure the success of Title III programs, the successful implementation of these programs in a demonstration school, and the successful dissemination of these programs once they have been validated in the demonstration school.

In order to achieve these objectives, it appears that two models are necessary. The first model is to be in the form of a set of guidelines, called Title III Guidelines (see Appendix B), which establishes the parameters of a Title III program and provides a rough basis by which the standards of that program can be measured. It is stressed that these guidelines are incomplete (the guidelines should always be flexible; new parameters and standards may be added as new programs are developed, and some standards and/or guidelines may not apply to new programs) and have not yet been validated. However, the source of Title III Guidelines, Media Guidelines, has been used for approximately a year for the writing and evaluation of media training programs, and its guidelines appear to also be applicable for Title III programs.

Although this model provides a mechanism for measuring the standards of a Title III program, this measurement is highly subjective for two reasons: 1) the state of the art of measurement is still such that a quick measurement of standards cannot be conducted by a layman, and 2) Title III Guidelines is not meant to replace an evaluation but to give the evaluator (and program administrators/participants) information needed in the evaluation or conduction of the program. This usage of Title III Guidelines may best be viewed as "an eye-ball formative evaluation."

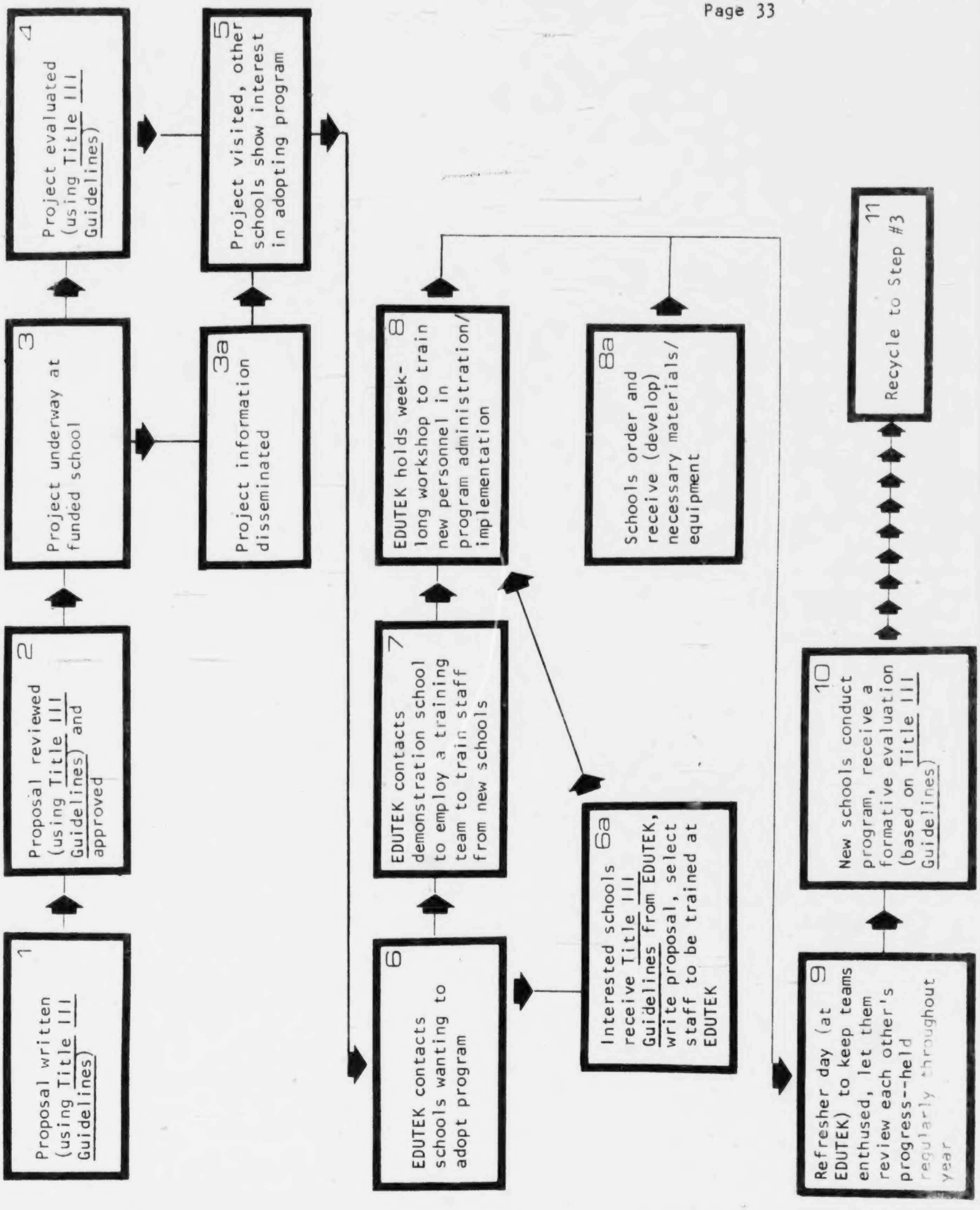
The second model, called the "Installation Model," provides a highly flexible method of dissemination of successful Title III programs, and makes use of Title III Guidelines in several ways. This model, by design, must be somewhat vague, since the method of dissemination depends largely on the manner in which that program is conducted, for whom the program is conducted (its public), by whom it is conducted, and the type of environment required to conduct the program. Since each school (like each learner) has different demands placed on it by the community, and, hence, has different needs, programs of similar nature will, of necessity, vary from school to school. Also, the politics of each school, both within and without, are different--people rather than positions dictate program success. Therefore, to insure this success as much as possible, a team approach might be indicated.

In the team approach, the ideal is total cooperation and total training of new staff members. In reality, this ideal is rarely achieved, and so the model calls for a mixture of teachers, administrators, policy-makers, specialists (and students where politics will allow them to be included) to be involved in the initial training. The use of a team from the successful program to do the training of personnel from schools seeking to adopt the program is also suggested, since involvement of peers is always important in innovation dissemination.

This mixture of personnel (Teachers, Administrators, Policy-makers, Specialists = TAPS) has led to profitable results in the Instructional Development Institute programs conducted by the National Special Media Institute consortium, and this model is an attempt to build upon that success, as well as to expand the concept by utilizing successful TAPS groups to train new ones. This idea is not completely new either, and the basic idea (peer involvement and successful innovators training prospective program staff) can be found throughout innovation/change literature.

The "Installation Model" in flow-chart form and an explanation of that model follow.

INSTALLATION MODEL


1
Proposal written (using Title III Guidelines)
2
Proposal reviewed (using Title III Guidelines) and approved
3
Project underway at funded school
4
Project evaluated (using Title III Guidelines)
3a
Project information disseminated
5
Project visited, other schools show interest in adopting program
6
EDUTEK contacts schools wanting to adopt program
6a
Interested schools receive Title III Guidelines from EDUTEK, write proposal, select staff to be trained at EDUTEK
7
EDUTEK contacts demonstration school to employ a training team to train staff from new schools
8
EDUTEK holds week-long workshop to train new personnel in program administration/implementation
8a
Schools order and receive (develop) necessary materials/equipment
9
Refresher day (at EDUTEK) to keep teams enthused, let them review each other's progress--held regularly throughout year
10
New schools conduct program, receive a formative evaluation (based on Title III Guidelines)
11
Recycle to Step #3

INSTALLATION MODEL

1. PROPOSAL WRITTEN:

The school that is to validate a Title III program writes a proposal to initiate the program. Title III Guidelines should be used to insure the inclusion of all necessary elements of the proposal.

2. PROPOSAL REVIEWED:

Using Title III Guidelines, Title III proposal reviewers evaluate submitted proposals and make recommendations to the funding agency. The funding agency then re-evaluates the programs using Title III Guidelines and criteria established by the agency, and funds those programs which are positively evaluated.

3. PROGRAM UNDERWAY AT FUNDED SCHOOL:

The funded school, usually termed a demonstration school, has three functions: 1) to conduct the program for the benefit of the school, 2) to validate the program, and 3) to disseminate information about the program and to explain program goals, methods of achieving those goals, and the results of those methods, to interested visitors.

A. PROGRAM INFORMATION DISSEMINATED:

Title III Guidelines allows for information dissemination as a legitimate expense of a Title III program in a demonstration school. Some of the many methods of dissemination available are: professional journals, professional meetings, direct mailings, dissemination through the state TItle III coordinators, U.S. Office of Education pamphlets and/or mailings, etc.

4. PROGRAM EVALUATED:

The program is evaluated, either formatively or summarily, by a third-party evaluator using Title III Guidelines and any other evaluation tools he deems relevant.

5. PROGRAM VISITED, OTHER SCHOOLS SHOW INTEREST IN ADOPTING PROGRAM:

If the program is working and if channels of information dissemination have been utilized, other schools will want to use the program. This step is obviously subject to the occurrence of these two important "if's"--however, given that the preliminary steps have been followed, this step will ensue.

6. EDUTEK CONTACTS SCHOOLS WANTING TO ADOPT PROGRAM:

For this to occur, it is necessary for demonstration school personnel to keep a record of visitors to their program. That this will occur is insured by two other factors: 1) the funding agency will (and does now) want that information contained in the project evaluation, and 2) the demonstration school personnel will be aware of the fact that they may be employed to train other persons adopting that program in the future.

A. INTERESTED SCHOOLS RECEIVE TITLE III GUIDELINES FROM EDUTEK, WRITE PROPOSAL, SELECT STAFF TO BE TRAINED AT EDUTEK:

At this point, the "Installation Model" departs somewhat from normal channels of dissemination. Instead of immediate implementation of the program, interested schools use Title III Guidelines to write their own program proposal. This provides a mechanism for the schools to adapt the program to their individual needs.

Because Title III Guidelines requires staff selection and time and money allocations, and attempts to insure the greatest amount of program success, it is important that an EDUTEK representative help interested schools in modifying programs to suit the needs and resources of each individual school.

7. EDUTEK CONTACTS THE DEMONSTRATION SCHOOL TO EMPLOY A TEAM TO TRAIN STAFF FROM INTERESTED SCHOOLS:

EDUTEK serves as a mediator to bring together innovators from the demonstration school and staff selected to implement the program in other schools. This step has two important consequences: 1) its existence helps to insure that a list of interested parties will be kept at the demonstration schools as explained under Step 6 of this model, and 2) this step provides peer teaching/peer involvement; because of this involvement, the personnel from the demonstration school has a vested interest in seeing this particular program disseminated, and it is doubtful that anyone is better qualified than demonstration school staff members to train others to conduct this program.

8. EDUTEK HOLDS (WEEK-LONG) WORKSHOP TO TRAIN NEW PERSONNEL IN PROGRAM ADMINISTRATION/IMPLEMENTATION:

Personnel from the interested schools is trained in program administration/implementation by the personnel from the demonstration school.

9. REFRESHER DAY (AT EDUTEK) TO KEEP TEAMS ENTHUSED AND LET THEM REVIEW EACH OTHER'S PROGRESS--HELD REGULARLY THROUGHOUT THE YEAR:

This step serves several purposes: 1) to keep enthusiasm from dissipating through regular "give-and-take" sessions between peers attempting to adopt/adapt a program and those experienced in that program, 2) to periodically provide reinforcement needed by new staff members, 3) to provide continual re-training and up-dating for all program staff, and 4) which is perhaps the most important, to allow program staff a chance to review their goals and take time for a period of self-assessment.

10. NEW SCHOOLS CONDUCT PROGRAM, RECEIVE A FORMATIVE EVALUATION:

    This evaluation again will be based on Title III Guidelines and will take the entire system into consideration. The evaluation serves three functions: 1) to assess the workability of the model, 2) to assess the success of new programs, and 3) to provide a final follow-up to the "refresher days."

11. RECYCLE TO STEP #3:

    It is anticipated that more schools will be interested in implementing programs as a result of completed program installation in other schools. The process begins anew.

There is an inferred time schedule in the above system. A demonstration school writes a proposal, is funded, and carries out its program for one academic year. During that year, outside interest is stimulated and more proposals (adoption proposals submitted to EDUTEK) are written. The week-long training course is held that summer, materials and equipment are ordered, received, or designed and developed. A "refresher day" is held to acquaint staff with materials and equipment just prior to school's opening and periodically thereafter on a regular basis. The process then begins again. This time schedule is viewed as an ideal and will (almost without doubt) have to be modified in individual cases.

If this process is followed, it is anticipated that the greatest possible amount of success will be insured.

TITLE III GUIDELINES CHECKLIST

(Adapted from Media Guidelines developed at
Teaching Research; Monmouth, Oregon; June, 1970)

By:
John B. Johnson

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    What are the guidelines?
    What do they contain?
    For whom are they intended?
    How can they be used?

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Title III

Guidelines Checklist

INTRODUCTION

Purpose: To assist those concerned with the design and appraisal of title III proposals and/or programs.

What is it? A list of criteria related to title III proposals/programs for planners and reviewers to consider, remember, gather information about, develop specifications around, and to judge against.

What does it contain? A series of statements that are concerned with essential elements that must be considered in planning and evaluating a title III proposal. The statements are grouped under the following headings: Final Summary, Pre-Program Planning, Objectives, Program Specifications, Evaluation, Participants, Management, and Facilities. A rating scale and format for judging the adequacy of the provisions for each part is provided.

For whom is it intended? For those who plan/design title III programs, judge the adequacy of title III program proposals, and evaluate the outputs of title III programs.

How can it be used? As a guide for:

1. Program Planners/Designers. Designers of title III programs can use the Checklist as a guide to systematically organize their planning efforts. Each section of the Checklist can be used by program planners as follows:

    A. Final Summary -- These statements are to provide an overall set within which to develop program plans. However, the program designer must attend to the other sections of the Checklist before he can complete this final summary.

    B. Pre-Program Planning -- Items in this section are to be used to determine the compatibility of the proposed program with local institutional constraints. Although these items are not central to the actual title III program, they are critical to the ultimate success of that program.

    C. Objectives -- These statements serve as a guide in dealing with the goals of the program and the essential details leading to those goals.

    D. Training Specifications -- This section contains items which direct the planner in attending to the details of instruction. Attention is focused on content, materials, settings, and strategies.

E. Evaluation -- These statements cover the major areas which the planner must consider in providing evaluation of the program.

F. Participants -- These items guide the planner in attending to student identification and selection.

G. Management -- These statements serve as a guide for the planner in attending to details such as organizing, staffing, supervising, and budgeting title III programs

H. Facilities -- This section contains items to which the planner must attend in planning physical facilities for the program.

2. Proposal Reviewers and Program Evaluators -- The Checklist can be used as a guide for systematically judging the adequacy of either the proposal or the program outputs.

3. Rating scale and additions to Checklist -- In the upper right corner of each page of the Checklist is a legend which gives the symbols to be used in rating program plans. A double column is included to provide a mechanism for planners and reviewers to compare their judgments.

   This Checklist is a prototype and subject to continued development. Therefore, it is expected that users will both modify existing statements and add new ones to meet their particular needs. Spaces for additions have been provided in each section.

Symbols
E.....provisions are Excellent
A..... " " Adequate
W..... " " Weak
M..... " " Missing
N..... " " Not needed

A. Final Summary (These items are to be answered when the remaining checklist pages have been completed. They were placed in the front to give the user the proper orientation to accomplishing the detailed planning.)

	Training Program Planner	Reviewer
1. The program has been sufficiently planned in all details to indicate that the Institution is capable of producing students having the desired competencies.	______	______
2. The plan of the program indicates flexibility to meet local and national needs, both now and in the immediate future.	______	______
3. The needs for providing credible and usable information in an unbiased manner to parties concerned with decisions regarding program continuation, expansion, modification, or replication in part or total has been specified.	______	______
4.	______	______
5.	______	______
6.	______	______

Symbols
E.....provisions are Excellent
A..... " " Adequate
W..... " " Weak
M..... " " Missing
N..... " " Not needed

B. Pre Program Planning

	Training Program Planner	Reviewer
1. The administrative commitment in the institution(s) in which the program will occur appears sufficiently firm to support the program.	______	______
2. Pre program orientation to heads of institutions, departments, districts, agencies, etc., who will have some level of responsibility in the program, has been planned.	______	______
3. Acceptance and/or approval of the program by those who will have some degree of decision responsibility in it has been obtained.	______	______
4. Resources which are critical to success in operating a title III program, i.e., local support staff, outside personnel, relevant materials, analysis of instructional context, management controls, etc., appear to be available and sufficient to support the program.	______	______
5. Procedures for disseminating pertinent information to participants prior to the program have been established.	______	______
6.	______	______

Symbols
E.....provisions are Excellent
A " " Adequate
W " " Weak
M " " Missing
N " " Not needed

C. Project Objectives

	Training Program Planner	Reviewer
1. Terminal objectives have been defined and are clearly stated.	____	____
2.	____	____
3.	____	____
4. (Participant Objectives) Terminal objectives for learners have been defined and are clearly stated.	____	____
5. Terminal objectives specify the level of proficiency expected of the learners.	____	____
6. Enabling or sub-objectives which lead to terminal objectives have been defined and are clearly written.	____	____
7. The conditions for demonstrating learning outcomes have been clearly stated in each objectives.	____	____
8.	____	____
9.	____	____

Symbols
E.....provisions are Excellent
A..... " " Adequate
W..... " " Weak
M..... " " Missing
N..... " " Not needed

D. Program Specifications	Training Program Planner	Reviewer
1. The types of learning required to perform the stated objectives, e.g., identification, classification, analysis, rule using, have been identified.	______	______
2. The learning experiences that must be provided participants to enable them to achieve criterion standards have been described.	______	______
3. The sequencing of instructional experience has been defined.	______	______
4. The setting required for each learning experience has been specified.	______	______
5. Instructional strategies for teaching each learning experience have been specified.	______	______
6. The instructional materials needed for each learning experience have been determined.	______	______
7. The required instructional materials are available either through commerical and/or other sources, or plans for their development have been specified.	______	______
8. For instructional materials that are not available elsewhere, specifications for their development have been clearly detailed.	______	______
9. Limitations regarding time and available resources have been considered in planning for the development of new instructional materials.	______	______

Symbols		
E.....provisions are		Excellent
A.....	" "	Adequate
W.....	" "	Weak
M.....	" "	Missing
N.....	" "	Not needed

	Training Program Planner	Reviewer
10. Equipment required in instruction has been specified and/or approved.	____	____
11. The rationale for use of unique and/or unusually expensive equipment has been stated and justified.	____	____
12.	____	____
13.	____	____

Symbols
E.....provisions are Excellent
A..... " " Adequate
W..... " " Weak
M..... " " Missing
N..... " " Not needed

E. Evaluation

	Training Program Planner	Reviewer
1. Procedures for evaluating the materials to be used in training have been defined.	______	______
2. Methods for evaluating the appropriateness and efficiency of the procedures to be used in the program have been defined and specified.	______	______
3. Methods for evaluating the degree to which the program is effective in reaching its objectives have been specified.	______	______
4. Procedures for determining the utility and feasibility of program materials when they are used in the field have been specified.	______	______
5. Evaluation of program management has been specified.	______	______
6. Procedures for assessing the impact of the program have been specified. (upon institution and/or learners)	______	______
7. Methods to assess the timeliness, economy, validity, and reliability of evaluative information have been identified.	______	______
8.	______	______
9..	______	______

Symbols

E.....	provisions	are	Excellent
A.....	"	"	Adequate
M.....	"	"	Weak
N.....	"	"	Not needed

F. Participants

	Training Program Planner	Reviewer
1. The essential characteristics of the individuals to be involved in the program have been clearly defined.	______	______
2. Criteria for participant eligibility including entry competencies have been established and clearly stated.	______	______
3. Criteria for participant screening and selection have been clearly defined.	______	______
4.	______	______
5.	______	______

Symbols
E.....provisions are Excellent
A..... " " Adequate
W..... " " Weak
M..... " " Missing
N..... " " Not needed

G. Management

	Training Program Planner	Reviewer
1. Job descriptions defining duties and responsibilities of all staff positions have been developed.	______	______
2. The competencies of both professional and support personnel are appropriate in terms of accomplishing the objectives of the program.	______	______
3. Commitments from outside staff and resource personnel who are listed have been obtained.	______	______
4. The number of staff members identified is sufficient to perform the services called for in the program.	______	______
5. In-service training to orient the staff to all phases of the title III program and to instruct them in specific needed skills has been planned.	______	______
6. Procedures that permit all persons directly affected by the program to be represented in policy formulation and revision have been specified.	______	______
7. The budget is clearly and concisely stated and supported by sufficient data and narrative to justify it.	______	______
8. A plan to inform all appropriate personnel of new or revised policies and operating procedures has been prepared.	______	______

Symbols
E.....provisions are Excellent
A..... " " Adequate
W..... " " Weak
M..... " " Missing
N..... " " Not needed

	Training Program Planner	Reviewer
9. A feedback network has been specified which provides for the exchange of information regarding personal matters between director and staff.		
10. A feedback network has been specified which provides for the exchange of information regarding program performance between director and staff.		
11. A communication service has been planned for keeping colleagues, interested publics, and institutional heads informed about accomplishments.		
12. The organizational structure has been sufficiently defined and charted to assure that responsibilities will be assigned effectively.		
13. The organizational pattern of the training program is flexible and adaptable to meet changing requirements.		
14. Supporting services, i.e., production, technical, statistical, clerical, personal, etc., both within and outside the institution, have been planned.		
15. Advisory bodies designed to review the adequacy of program planning and operation with a membership commanding respect, have been planned and tentative commitments obtained.		

Symbols
E.....provisions are Excellent
A..... " " Adequate
W..... " " Weak
M..... " " Missing
N..... " " Not needed

	Training Program Planner	Reviewer
16. The plan for scheduling instruction, facilities, materials, equipment, and personnel has been specified.	____	____
17.	____	____
18.	____	____

Symbols
E.....provisions are Excellent
A..... " " Adequate
W..... " " Weak
M..... " " Missing
N..... " " Not needed

H. Facilities

	Training Program Planner	Reviewer
1. Space of acceptable quality has been specified and planned for:		
a. Classrooms	______	______
b. Laboratories and/or studios	______	______
c. Carrels	______	______
d. Study areas	______	______
e. Conference rooms	______	______
f. Office facilities	______	______
2. Library resources to meet staff and student instructional needs have been planned.	______	______
3. Storage is available to handle all physical needs of the program.	______	______
4. The installation and operation of special equipment requiring particular physical facilities, i.e., power supply, venting, lighting, etc., has been specified.	______	______
5.	______	______
6.	______	______

Appendix B

Reaction to
EDUTEK's "Title III Guidelines" and "Installation Model"

by:
Jack Baillie, Director, Title III, Nebraska Department of Education

Installation Model

The proposed model is related to the producer-consumer school concept which was initially put into practice at a national Education Fair, ED/Fair '72, in Washington, D.C., last week. While both concepts have strengths, the basic weakness is that of the cost-effectiveness of a total project. We might be a little naive if we expect our midwestern schools, most of which are conservative in nature, to totally adopt or adapt projects. The current practice appears to be to single out those activities or portions which a potential "consumer" wants and to adapt those to his local situation.

Title III Guidelines differ slightly in the four-state area, and each state differs somewhat from those of USOE. The biggest difference is the amount of time necessary to actually develop and implement a proposal which is worthy of funding.

As presented, the installation model assumes that valid, reliable evaluation data would be available near the end of the first year of a project. This is not always the case; it would appear more appropriate to start at Step 4 of the model with a proven project. I would suggest an alternative model to the one exhibited as Appendix A. This model is presented at the conclusion of this paper.

Since the funding of activities is a recurring problem, the complete involvement of State Departments of Education is a necessity. They could provide the "wherewithal" to assure completion of such a plan.

Guidelines Checklist

A new title is mandatory since the word "Guidelines" suggests state or national directives which this list does not contain. As noted, the checklist itself is not complete. As a guide for program planners it should be expanded; EDUTEK is referred to State Departments of Education and USOE for suggestions. There is a "draft copy" of a publication (developed through USOE) called "Accountability Manual" which contains many of the essential elements for such a checklist.

A checklist needs to be developed as an aid to the program planner; so unless it meets the idiosyncracies of a specific program, it does not serve this purpose. Most schools write a project for a specific purpose and do not allow themselves the luxury of general planning as suggested in this checklist.

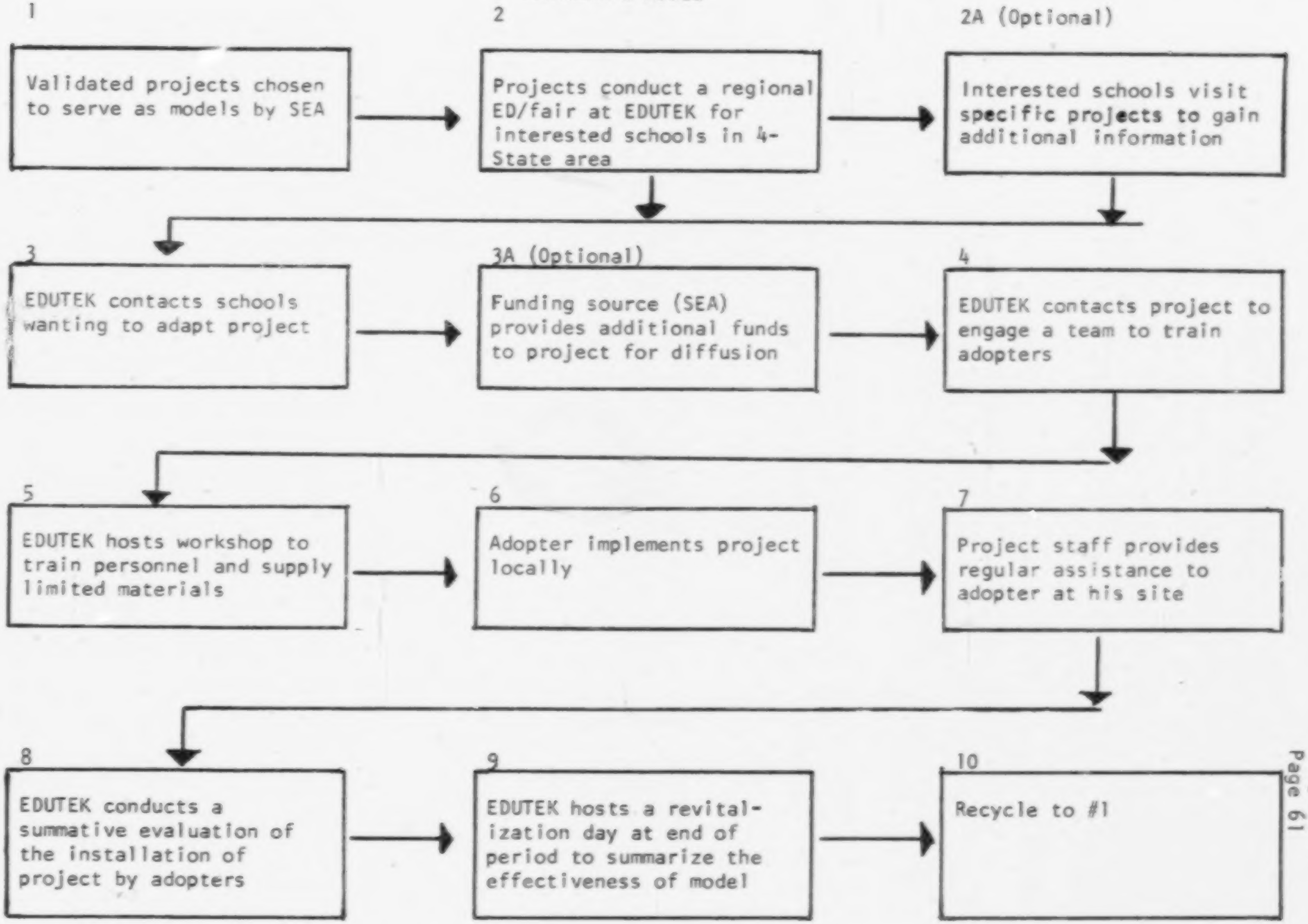
Installation Model - This is the important model, since it is this model which will help make programs transportable from school to school. The flow chart is well conceived and can accomplish its purpose, yet is flexible enough to fit many different patterns and needs. I certainly encourage this model over the use of the demonstration school idea that has been used in Title III dissemination guidelines.

A compilation of information on the operation of Title III projects would be a worthwhile endeavor. This idea could possibly be incorporated into Step 3a. In addition, if schools would submit a list of needs and desired programs to EDUTEK, EDUTEK could then match these programs with appropriate operation information and opportunities for program adaption would be increased.

One concern involves the assistance that is available to the many small school districts in the four-state area for writing proposals. Without personnel in the project-writing field, these small districts are at a distinct disadvantage, and some method of assistance should possibly be considered.

Over-All Summary - I feel that the project is well written and has significant value to schools in the four-state area.

ALTERNATE MODEL


1
Validated projects chosen to serve as models by SEA
2
Projects conduct a regional ED/fair at EDUTEK for interested schools in 4-State area
2A (Optional)
Interested schools visit specific projects to gain additional information
3
EDUTEK contacts schools wanting to adapt project
3A (Optional)
Funding source (SEA) provides additional funds to project for diffusion
4
EDUTEK contacts project to engage a team to train adopters
5
EDUTEK hosts workshop to train personnel and supply limited materials
6
Adopter implements project locally
7
Project staff provides regular assistance to adopter at his site
8
EDUTEK conducts a summative evaluation of the installation of project by adopters
9
EDUTEK hosts a revitalization day at end of period to summarize the effectiveness of model
10
Recycle to #1

As presented, the checklist would be more applicable for determining project output, since it could be easily adapted to various situations. If EDUTEK is seriously interested in providing a service to area schools, then it would be appropriate to utilize the talents of those persons who deal directly with Title III, i.e. the SEA and project staff, and not the Superintendent of Schools, who has only a vague notion of what is happening with Title III. It is the practitioner who must actually do the work, not the "inspirational" leader.

Summary

A good base has been established, both through the materials developed prior to this session, and from those written by the participants. These products will both need to be refined. In order to validate them prior to widespread usage, it is suggested that a "representative" group review and react to the products of this session.

It is strongly urged to involve State Departments of Education, particularly Title III, in EDUTEK activities. Since states are charged with broad dissemination responsibilities (although some do not respond), EDUTEK should compliment, not compete, with state activities. States are also a possible source of limited financial resources and can provide certain technical assistance.

With much already done by other agencies and persons, there is no need to reinvent the wheel. USOE is pushing the producer-consumer school concept, and should be most receptive to other agencies that wish to help with their current project. Mr. Tom Burns, Deputy Associate Commissioner of BESE, could be contacted for possible help.

Reaction to
EDUTEK's "Title III Guidelines" and "Installation Model"

by:
Arzell Ball, Superintendent of Schools, Shawnee Mission, Kansas

Introduction

In the fourth paragraph, I suggest that "Therefore, to insure this success as much as possible, a team approach might be indicated" be changed to read "To insure as much success as possible, total community involvement in the development and follow-through of the program should be planned from the beginning. Program-community interaction should occur through advisory committees, students, parents, representatives of labor and management, and racial and ethnic minorities participating in the program."

Change the first sentence of the last paragraph on page 1 to read "With program-community interaction, the ideal is total cooperation and total training of new staff members, and the maintenance of a continuing community commitment."

Flow Chart (Appendix A)

Add to and rearrange Step #1 of the flow chart so that it reads:

1. Identify and assess educational needs of the student and the community he is in and/or will be entering.
1A. Take inventory of instructional capabilities (school and community)
1B. Proposal written (using Title III Guidelines)

Installation Model

Change the second paragraph of Step #6A to read "Because Title III Guidelines requires personnel and community resources and the establishment of priorities for curriculum change agreed upon by advisory committees, it is important that an EDUTEK representative . . ."

Title III Guidelines Checklist

Introduction: Change the title of part H from "Facilities" to "Materials, Equipment, and Facilities".

Section G:

Change the title from "Management" to "Job descriptions and Targets".

Section G (cont.)

#1. Change to read "The duties, responsibilities, and relationships of each administrative, supervisory, and staff position have been clearly stated and made available through the printed materials of the program."

#3. Change to read "Management has brought together adequate community and/or district resources to insure the success of the project."

#7. Add to read "A system of accountability has been established. The budget is . . ."

#8. Add to read "The organizational structure has been clearly defined, administrative procedures disseminated, and a plan to inform . . ."

#9. Change "A feedback network has" to "Internal communications have".

#10. Change to read "Objectives for the program have been specified which are based on an assessment of needs."

#11 or 15. Add at the end "Community acceptance is important to the success of the program."

Section H: Add the following:

#5. Supplies, equipment, and facilities are necessary to the operation of the project.

#6. Facilities are modern and well maintained.

Shawnee Mission is interested in EDUTEK; Terry Parks is Director of Funded Projects, and Rex Carr is Director of Educational Communications. Address: 7235 Antioch, Overland Park, Kansas.

We are interested in:
- A. Automating Special Education resource materials.
- B. Automating all instructional (library) materials.
- C. 1. Developing an outstanding system of C.A.I. and C.A.T.V.
  - 2. Hardware on hand: 360/50 IBM computer, color TV studio for district.
- D. Developing automated support systems with information capabilities to provide:
  - 1. Student data--profiles
  - 2. Program data (accountability)
  - 3. Educational-vocational projection
  - 4. Follow-up and/or placement
- E. Developing automated personnel (all employee) systems including records, state and federal reports, payrolls, etc., with visual terminals.
- F. Etc.

Shawnee Mission is willing to evaluate former Title III programs within the district.

Reaction to
EDUTEK's "Title III Guidelines" and "Installation Model"

by

Robert D. Benton, Superintendent of Public Schools, Council Bluffs, Iowa
(State Superintendent of Public Instruction, State of Iowa, after July 1, 1972)

As was pointed out in our preliminary discussions, there has been a high national mortality rate of Title III projects. This mortality rate has been due more to the lack of local funds for continuation of the projects than to the actual failure of these projects. In addition, it is my own personal opinion that many school districts have not been willing to let tried and proven programs developed under Title III grants supplant status quo programming in their schools.

Whatever the reasons, it has been unfortunate, to say the least, that Title III programs have not had a greater impact on education. As I have perceived them, the original purposes of Title III were to provide the funds and opportunities for innovation , and to be the "growing edge" of education--in other words, to be the "agent for change."

The purpose of this report is to review certain instruments developed by EDUTEK, namely a flow chart depicting the implementation of the "Installation Model", and "Title III Guidelines Checklist."

Installation Model

A prime ingredient seems to be missing in the flow chart--that ingredient concerns needs assessment. No project proposal should ever by considered or written until a need or needs have been demonstrated. Yet, Step #1 of the flow chart reads "Proposal written (using Title III Guidelines)"--there is no mention of needs. I believe that this lack of determining needs may have contributed to the mortality rate mentioned earlier.

Closely allied to this is the failure to adequately involve available personnel in the planning stages of a project. The flow chart does not indicate such involvement until Steps #6a, 7, and 8. I am fully aware that involvement of prospective staff members beginning with Step #1 as the model is written and my "needs assessment" step, may lead to frustration and anger if Step #2 (project approval) is never achieved, but the old adage "It is better to have loved and lost than never to have loved at all" may have application here. It does not hurt personnel to be involved in the pre-planning stages, and certainly the experience they have gained will pay large dividents toward the eventual success of the project if it is approved and implemented.

Our discussion also brought out that the terms "week-long" in Step #8 and "refresher day" in Step #9 are generic in nature. It may or may not take a "week" to "train" personnel; it may or may not take a "day" to "refresh." The point I would emphasize is that time determinations need to be made in light of the demands of each project.

Finally, I would make a general comment on the flow chart itself. I feel that flow charts or some other forms of organizational structures are highly desirable when planning and/or implementing projects. I do feel, however, that sometimes we are tempted to let these devices become ends in themselves. My suggestion would be that a flow chart should be considered as a "vehicle" to achieve a stated purpose, and that this "vehicle" should be able to be "driven" toward that purpose. This analogy implies the ability to change directions.

Title III Guidelines Checklist

My comments about the "Title III Guidelines Checklist" are very limited. First, I think the "Checklist" is very usable, and seems to fulfill the function of such an instrument. I particularly like the "Management" section. It seems to me that the various management techniques contained in this section are essential to a successful project. These techniques, in and of themselves, will not assure success, but they must be followed in order to determine success (or failure). The "feedback" items are particularly good.

There does seem to be a lack of provision for staff evaluation in the "Checklist." I would tentatively put it in the "Management" section, but it may be more appropriately placed somewhere else. Also, you may wish to include the "equipment and materials" mentioned in Step #8a of the flow chart in the "Facilities" section of the "Checklist."

I see no real weaknesses in the "Checklist." Again, I would urge you to let this checklist be a means instead of an end. Adapt and use those parts most related to a given project, and if a certain section or item has a limited relationship to a project, eliminate it, or at least don't use it.

Reaction to
EDUTEK's "Title III Guidelines" and "Installation Model"

by:

Dwight Davis, Superintendent of Schools, Des Moines, Iowa

If the Title III project is to be a successful model, proposal guidelines need to include time and funds for training local staff in conducting tours of visiting "firemen".

The replication of successfully demonstrated programs should stress the need for each one being unique for a given site and personnel involved. The success of most programs depends heavily on the persons involved and the growth of the local staff as it goes through the process of creating and initiating a unique program.

The name Title III Guidelines, as used here, is confusing in its resemblance to "Title III, Guidelines" of U.S.O.E.

Introduction

On page 1, paragraph 4, the mentioned team approach is possible, but each model needs a key person to serve as the leader, an expediter, facilitator, etc.

Installation Model

As others have noted, the preliminaries to Step 1 in Appendix A -- needs, preplanning, who decides a proposal should be written, etc. -- have been omitted.

Between Steps 3 and 6, EDUTEK or others may need to be plugged in to some on-site monitoring of a program. Current programs may be changed to the proposed program during the course of one, two, and three years.

More should be said concerning the custom-making of a replication, rather than the duplication of a successful innovative program.

The local school with the successfully demonstrated model needs additional funds and staff time to disseminate its ideas, problems, failures, and successes.

Will U.S.O.E. fund the staff development of an adapted demonstration model?

Although some of the assistance to be made available by EDUTEK should be done through State Departments of Education, an outside agency might be of more assistance and be more flexible in bringing together innovators and implementors. The regulation and financial limitations of state departments are a definite handicap.

Another reason for an outside mediator is that we seem to have too few "nuts" or, I should say, innovators and creators, around the country in the field of education. Because of lack of available means of dissemination or perhaps because of the reluctance of colleagues to accept leadership from "nuts," even their great accomplishments have not proven very effective in creating rapid and needed changes in education.

Step #9 is definitely needed, just as frequent sales meetings are useful to the salesman.

Guidelines Checklist

Appendix B should not be used as though it were complete or as if each item is appropriate for every demonstration project.

Many, if not most, of the checklist items require a value judgment based on insufficient data or background; i.e. on page 5, under item A-1, who determines what the "desired compentencies" are? or, if a program is innovative, how can planning be in "sufficient detail"? or, under Item A-2, what does "flexibility" mean to any one person, or more importantly, can two people agree on its meaning?

In each item of the checklist, certain assumptions are made regarding programs, education, planning, management, etc. -- are these same assumptions true for every Title III program?

Item C. What is the practical distinction between "terminal objectives" and "enabling or subobjectives"?

Item D. Is the assumption here that learning is sequential, only takes place in a school setting, and has controlled elements? Teaching may involve some of these, but learning does not.

Item F-1. Can "essential" characteristics ever be clearly defined?

Summary

I think the model is good if one accepts the notion that innovative programs can be organized, managed, and replicated with adaptation.

Reaction to
EDUTEK's "Title III Guidelines" and "Installation Model"

by:
Ruie Dullin, Superintendent of Schools, North Kansas City, Missouri

Basic Concern

How can North Kansas City utilize Title III in order to finance portions of its program called "Center for Educational Development"?

What is CED? CED is:

a. A $500,000 facility, new and partially staffed -- so far only local funds have been used.
b. The central idea is to deal with situations (problems, techniques, systems, organizations, etc.) within the school district that have to do with teaching and learning.
c. We envision that a two-way flow of ideas, answers, hunches, and the like will characterize the operation. Our staff wants this to be a visible, positive force that will really do something about the old "individual differences" concept. This assumes that we are not now doing much that promises to solve this problem, even at a low standard.

Other Anticipated Outcomes:

a. It is assumed that many good practices in the various school units go unnoticed district-wide. CED will act as a "scavenger" to bring these superior educational plans together and will (1) examine them, (2) refine them, and (3) determine whether they should be "exported" to other school units. (The transportable idea.)
b. CED will be researching and developing innovative approaches (for the purposes of upgrading staff and improving learning opportunities) that are worthy to be tried in actual school situations.

Summary

We believe that accessibility is altogether essential for the development of means of changing status quo education. A time lag is deadly once a staff is up for action. Secondly, the Center will provide the vehicle for bring to bear both the staff expertise and the expertise of agencies (government, higher education, the State Department of Education, etc.) on the problems of greater student achievement and more effective teaching.

Finally, when this Center comes of age, we fully expect that teacher and staff frustrations will be significantly reduced.

To the EDUTEK Staff: On request, Dr. Blaine Cole, Director, will provide you with materials developed to date concerning the Center.

Dr. Blaine Cole, Director
Center for Educational Development
2000 N.E. 46th Street
Kansas City, Missouri 64116

Reaction to Title III Model

Guidelines Checklist

a. A change in the sequence of the sections in the checklist might increase the usability of this instrument. B and C could be reversed (this is not quite a chicken and egg sort of thing) and F could follow B. My order would be: A, C, B, F, D, E. G. H.
b. Who will be involved in determining needs? Students could help but the fact that they are strapped for time is a concern.
c. The checklist seems to require a lot of "policing". Don't object, I just wanted to say I noticed.
d. The requirements are tight, but I'm not convinced this is bad. Voluntary motivation for many students is inadequate.
e. The management section is excellent.

Installation Model

I'd like to see a more definitive statement on the obligations of the demonstration school. (Staff, inside system, and those provided for under Title III.)

(Without offense)-- The church and state issue would be a deterrent in our state. I'd like to know more about how this issue affects funding under the Missouri Constitution.

A good experience to be your guest. Thanks.

Reaction to
EDUTEK's "Title III Guidelines" and "Installation Model"

by:
Jack Elliott, Superintendent of Schools, North Platte, Nebraska

Introduction

Consider adding another primary objective: to provide a thorough checklist for the successful evaluation of the program.

Explain whether Title III Guidelines are state, federal, etc.

Be more positive in the following statement: "Therefore, to insure this success as much as possible, a team approach might be indicated." Perhaps "Therefore, to insure this success as much as possible, a team approach is highly recommended."

The phrase "and students when politics will allow them to be included" is not positive and seems to give the reader the impression that students are not necessarily important. Instead, there should be a positive statement regarding the involvement of students.

Flow Chart

Perhaps there should be a step before #1 involving the determination of needs.

It should be made clear that EDUTEK will help write proposals (in Step #1). This is very important to small schools.

Installation Model

#1. Proposal written. State in this section that EDUTEK will aid the school in writing the proposal.
#4. Could this statement be more specific regarding the identity of a "third-party evaluator"? Also, could some examples of other "evaluation tools" be listed?
#5. The word "if" does not place a positive tone to this statement. It could read as follows: "After the program is working and channels of information dissemination have been utilized, other schools will want to use the program. This last step is dependent on the successful completion of the preceding two steps."
#8. Should it be mentioned where this workshop will be held?

Title III Guidelines Checklist

Introduction. Should the headings be in logical sequence? For example, you have "Final Summary" as the beginning.

Section A, #3. This needs clarification.

Section B, #3. The phrase "some degree of decision responsibility" is ambiguous. As it is written, this could possibly include someone such as the custodian.

Section C, #1. This could be changed to read "Terminal objectives have been defined, clearly stated and disseminated to all participants."

Section D. Good section - complete.

Section E. Good.

Section F, add #4. Criteria for participant evaluation, including measurement of gain, have been established and clearly stated.

Section G, #1. This statement may serve as a maximum for many people. Job descriptions should be in detail in order to avoid this. As brought out in our discussion on job descriptions, they should be explicit and not broad. Perhaps the statement should read, "Explicit job descriptions defining . . . ."

Section G, #5. Add to read ". . . has been planned and carried out."

Section G, #8. Add to read ". . . has been prepared and disseminated."

Section G, #9, #10, #11. Are "feedback network" and "communication service" the same thing?

Section H, add #5. Adequate custodial services are available to handle the needs of the program.

Section H, add #6. Transportation is available as needed.

Summary

I would list the advantages of the project as follows:

1. It is written in concise, clear terms.
2. It appears to be very complete.
3. It will serve as a valuable aid in numerous other areas, especially the checklist.
4. If used properly, it will eliminate duplication in many areas.
5. It will enable schools to benefit from experiences of others.
6. The flow chart is easily understood and complete
7. It could be very valuable to small schools who fear writing and evaluating proposals.

I would list disadvantages as follows:

1. It needs to provide for a compilation of Title III projects. This summary would show areas of strengths and weakness of the program.
2. The area of evaluation needs to be more complete.
3. The "Guideline Checklist" is not in a logical sequence.
4. EDUTEK's availability and competencies need to be publicized and clarified.

Reaction to
EDUTEK's "Title III Guidelines" and "Installation Model"

by:

Joe Herndon, Superintendent of Schools, Raytown, Missouri

Summary

May I express my thanks for the invitation to attend this conference. It has been most interesting and informative. Although I do not work directly with these programs, I am happy to be better informed.

It is very difficult to add to a program that has been outlined so well. In my opinion, there has been a great need for this type of program since the inception of federal programs. In our district, I am sure we have not received federal funding in many areas that we should. With the professional help proposed in this program, great help could be received.

I would like to see a report of all the programs offered in the four states compiled and distributed, with reactions to the programs in the local districts.

I agree that students should play a part in setting up programs; however, we need guidelines for this purpose.

I am concerned with federal programs that serve only for a short period of time and have no "carry over" into the total school program. I am sure EDUTEK can render a real service in this area. If the procedure, as outlined, is followed, we would have a definite answer to the programs.

I would like to see more emphasis on programs for instruction rather than hardware that in many cases is not used properly.

If possible, I would like to see area meetings set up in which the people in charge of the programs would be invited, with EDUTEK conducting the meetings. We need this help. We would be happy to serve as the sponsor for this meeting.

Under "Evaluation," it might be well to consider an item providing for published results in the local press.

Under "F - Participants," add an item to insure that participants are properly informed and dedicated to the project.

I do not recall that boards of education are involved. Perhaps they should be.

Reaction to
EDUTEK's "Title III Guidelines" and "Installation Model"

by:
John Prasch, Superintendent of Public Schools, Lincoln, Nebraska

Summary

In paragraph 1 of the introduction, there is need to clarify the use of the word dissemination. One connotation of dissemination would see the need satisfied by simply distributing materials about the project. This connotation is reinforced by the illustrations of dissemination (Item 3A of the description of the installation model). I believe the intent of the wording in paragraph 1 is to connote a broader meaning of diffusion and/or replication, etc., rather than a narrow interpretation which may be misread into this statement.

Likewise, in paragraph 2 of the introduction the use of the terminology "Title III Guidelines" is confusing because we already have a set of Title III Guidelines from State Departments which are different from the reference here. "Installation checklist" might be a more definitive description. I also find some difficulty in the statement that the checklist is one of two models. I would prefer to see an "installation model" a part of which is an "installation checklist".

Again this may only be semantic knitpicking, but I do object to the description of the guidelines as "somewhat vague" (paragraph 4 of introduction). I'd prefer you explain why they need to be general rather than specific without admitting to vagueness.

In the description of the installation model reference to Title III Guidelines is unclear as to whether the State guidelines are meant or the checklist in this model. If the latter is intended, then there is the question of whether the funding agency will adopt or use this checklist or how they will be exposed to it. Reference to Title III guidelines also is unclear in relation to Item 4, evaluation.

In Item 6 of the description of the installation model EDUTEK is mentioned for the first time. I assume that an appendix piece or some other explanation of EDUTEK will also be introduced or referred to at this point. In this connection it is important to know that the U. S. Office is attempting to push State Departments into this role. Some arguments, and there are good ones, as to why an EDUTEK rather than a State Department can best serve this function, may be appropriate, depending on the intended audience of this document.

I have some problem with the assumption that one year is the ideal operation time from which we move into replication as a second year endeavor. Adoption proposals may be premature if written during the first year.

There may be some confusion with respect to proposal writing on the part of the school which is attempting to install a program already on-going. Could this be eliminated by calling this an installation plan rather than a proposal?

In Item 1.C in the introduction of the guidelines checklist, the critical reader may object to the apparent use of goals and objectives as synonymous terms.

Title III Guidelines Checklist

B. Pre-Planning

One of the persistent problems under pre-program planning for Title III and other Federal projects is to distinguish between bonafide pre-planning as distinguished from that which simply goes through the motions of satisfying guidelines. Some of this understandably results from time pressures involved in planning for Federal projects but some also results from simple callousness with respect to guidelines which may not be very realistic. It might be useful in this respect to have some fairly specific checklist items which relate directly to the evidence of pre-planning. Such evidence might include minutes or summaries of pre-planning sessions, dates or numbers of such sessions, list of those involved, etc. Letters of endorsement constitute weak evidence since refusal to endorse may cut off future inter-agency support and refusals are rare.

The new style of pre-planning meetings by the U. S. Office for those who are writing proposals may need to be included in the checklist. It would appear that the U. S. Office is attempting to insure some pre-planning by this strategy as well as to control and standardize certain facets of planning and evaluation.

C. Project Objectives

The following additional item is suggested: Terminal objectives for the project and for the participants clearly relate to stated goals.

There is no direct mention in the several statements about objectives concerning the measurability of the objectives. Some would argue that by definition an item is not an objective if it cannot be measured. Whether or not it is intended to adhere to such a definition of objectives could be clarified, either by offering a definition to accompany the checklist, or by including an item which speaks to the problem of measurability.

D. Program Specifications

Items 2 through 6 in this category seem to make some assumptions about or place some value judgements on a certain approach to instruction that may or may not be appropriate to a given project. For example, item 2 implies that a specified learning experience "must" be provided. Item 3 assumes that there is a fixed sequencing of experiences. Item 4 connotes some specificity to the setting. These are important considerations in a project that is oriented toward the careful packaging of learning experiences, but may be inappropriate for projects which are seeking to provide flexibility, opportunity to adjust to interest or circumstance, or experimentation in individually oriented learning styles.

Perhaps this problem could be helped by supplying some "weasel" words such as "where appropriate". It could further be helped by requiring some attention to conscious choice of learning theory or instructional rationale that is being applied in the project.

E. Evaluation

The following additional items are suggested: There is evidence that provisions for evaluation were an integral part of the overall project planning.. It is clear to whom the evaluation is reported. There are clear provisions for use of the evaluation in modifying the recycled program.

G. Management

Item 6 seems quite broad, reflects a value judgement, and may be a severe restriction on innovations. As stated and if strictly interpreted, the item restricts management style. Although I generally ascribe to a process oriented style which spreads decision-making, I believe that other options might be left open particularly when looking for innovations. Sometimes broadly shared decision-making prevents the implementation of changes clearly called for by data generated in a project. This most often happens when contemplated changes threaten staff or students or go counter to parent expectations for program. I would prefer the checklist item to say, "Provisions for decision-making and policy formation are clearly specified and generally understood".

I do not understand item 9, but suspect is heavily laden with a value judgement which may or may not be appropriate.

Item 12 and 13 may be somewhat incompatible. Could they be combined to say, "Although the organizational structure is sufficiently defined and charted to assure that responsiblities will be assigned effectively, there are well understood mechanisms for change in order to provide the flexibility and adaptability to meet changing requirements".

Reaction to
EDUTEK's "Title III Guidelines" and "Installation Model"

by:
Dale Siefkes, Superintendent of Schools, Waverly, Nebraska

Introduction - As is stated, the primary objectives of the project are to develop an installation model, the successful implementation and the successful dissemination of Title III programs. It was also related that this is a product-oriented project and not a process tool. From the understood role and function of EDUTEK as a facilitator, this is a proper approach. Nevertheless, I would suggest that prior to involvement in the installation model, a needs-study be completed by the local school and that this study be confirmed by EDUTEK. This study would and should be a local responsibility. EDUTEK's role would be to use this as a starting point in the development of goals leading to the accomplishment of the primary objectives.

I agree with the necessity of the two models ("Guidelines" and "Installation Model"). They relate well to both the standards and the methods of obtaining a program.

Pre-Program Planning - The 5 statements given are all proper for inclusion. I might suggest that a statement relating to the completion of a needs-study also be included. Additionally, I might suggest the following changes:

Change the word "appear" in statements #1 and #4 to "has been determined".
Change the word "some" in statement #3 to "a significant".

Project Objectives - The inclusion of a statement relating to participant/staff objectives, as is done in #4 with participant/student objectives, is suggested. My reaction to the remainder of the statements is very good.

Program Specifications - A very good list of statements.

Evaluation - My only suggestion would be to include a more specific statement on staff evaluation.

Participants - This is a good set of statements.

Management - The inclusion of the word "targets" in statement #1 is suggested. This is important because the program specifications of a Title III project relate specifically to a stated goal. The importance of statements #6 and #8 should be noted and emphasized.

Facilities - In order to assist in budget breakdowns, add the words "Equipment and Supplies" to the title of this subdivision.

Summary - This is a necessary model that is presented well; the introductory statement is well written and self-explanatory.

74/85

PROJECT 3

VOCATIONAL MATERIALS PREPARATION

PROJECT PERIOD
July 1, 1971 - June 30, 1972

PROJECT INVESTIGATORS
W. R. Miller, F. M. Miller

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incorporated
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USOE Contract No.: OEC-0-71-1253
EDUTEK, Inc.

86/87

PROJECT #3

ANNUAL REPORT

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I. Purpose:

The purpose of this project was to develop a competency-based, self-instructional program in drafting technology which would be appropriate for disadvantaged and handicapped learners, thus facilitating their entry into the field of drafting.

II. Objectives:

The project objectives were:

1. Determination of industrial specified performance criterion in drafting technology.
2. Development of competency-based, self-instructional program in drafting technology characterized by modular organization or curricular material.
3. Initial design of training program for orally and physically handicapped learners.
4. Analysis of developed program to determine necessary modifications for utilization with orally and physically handicapped learners.
5. Development of supplementary learning materials for adaptation to the educationally handicapped learners.
6. Field testing and evaluation of developed programs.
7. Design strategy for dissemination of materials to institutions and agencies for utilization.

III. Methodology:

In order to achieve the project's purpose, the following plan was followed:

1. The literature was surveyed in an effort to identify competencies required of entry-level draftsmen as follows:
    a. An ERIC V-T search was made to identify research reports as well as curriculum guides and analyses (see Appendix A).

b. USOE, NASA and other governmental publications were reviewed.

c. A thorough review was made of:

   (1) The 1971 "Drafting Room Survey" conducted by the American Institute for Design and Drafting involving 170 companies located in thirty-nine states and Canada. This study included 720 employers and 16,560 draftsmen.

   (2) A 1971 study of "A Task Analysis of Drafting Standards in Selected Industries of Southern California" involving 43 companies and 2,390 draftsmen.

   (3) A 1970 study of "A Survey of Equipment, Methods, and Educational Needs of Industrial Drafting" involving 250 industries and 8,000 draftsmen.

d. The USOE publication "Draftsman Entry, A Suggested Guide for a Training Course" was utilized in developing the basic list of competencies.

2. The curricular materials designed to develop personnel in the field of drafting technology were identified and reviewed as follows:

   a. Correspondence and other self-study materials for drafting courses were secured from colleges and universities for review (see Appendix B).

   b. Twenty-eight technical schools were contacted to secure information and materials for review (see Appendix C).

   c. Fifty-nine colleges and universities were contacted to secure information and materials for review (see Appendix D).

   d. Publications produced by vocational-technical education instructional materials laboratories for use in secondary and post-secondary programs of drafting were reviewed (see Appendix E).

3. Research findings and other literature which could reveal evidence of unique requirements and/or limitations of handicapped persons who seek training and/or employment in drafting were reviewed.

4. Competencies were identified for personnel employed in drafting as a result of a careful study of the materials obtained in steps 1 to 3.

5. Those competencies which must be acquired by individuals who seek entry-level employment in the field of drafting were selected. These competencies became the performance objectives for the self-instructional modules.

6. After reviewing several module formats, a standard format for the modules was developed (see Appendix F).

7. A preliminary list of Unit Titles was prepared with a breakdown of Module Titles for each unit (a complete list appears in section IV, page 93). The list was revised and refined as the modules were developed.

8. Two textbooks and a workbook were selected after considering nine books that contained the information required for the learning experiences in the sixteen units. The potential references were systematically analyzed through the use of a textbook appraisal form, and the readability was checked by application of the Flesh formula.

   a. Giesecke, Mitchell, Spencer, Hill, Technical Drawing, New York: The Macmillan Company, 5th Edition, 1967.

   b. Giesecke, Mitchell, Spencer, Hill, Technical Drawing Problems, New York: The Macmillan Company (Series I), 1967.

   c. Spencer, Dygdon, Basic Technical Drawing, New York: The Macmillan Company, Second Revised Edition, 1968.

   A list of equipment was selected (see Appendix G) and the appropriate materials packaged into a kit for each student.

9. Three module writers and two draftsmen were employed to assist the principal investigators in the development of the self-instructional modules through which individuals could gain the competencies leading to employment in an entry-level occupation in the drafting field. A three-stage plan was developed for the writing, review and the addition of drawing examples to the modules.

   The plan developed was as follows:

   a. Modules were written, reviewed, edited and rewritten.

   b. Drawings were produced and reviewed.

c. Written materials and drawings were assembled and reviewed.

10. A rationale related to the selection and development of persons with special needs into the field of drafting technology was prepared (see Appendix H).

11. Nine students from four institutions were involved in the initial field testing. The institutions represented were:

    a. Exeter High School, Exeter, Nebraska

    b. Bradshaw High School, Bradshaw, Nebraska

    c. College of Agriculture, University of Nebraska-Lincoln

    d. Nebraska Technical School, Milford, Nebraska

    One student completed three units successfully; two students completed two units successfully; one student completed one unit successfully; and five students completed several modules of unit I. Of the five students, two received incompletes.

    The steps followed in the initial field testing were:

    a. The units to be tested were distributed to a proctor at each institution.

    b. The proctor distributed the modules and unit examination to the student as the student completed each portion of the unit.

    c. Each completed module was mailed to EDUTEK, and a record was made of the completion of the module.

    d. The principal investigator evaluated the student's work on each module and notified the student of his success or failure in achieving a 90 percent accuracy level (see Appendix I). Also included were any pertinent comments on the work performed by the student.

    e. Upon completion of the unit examination, the student was notified by means of a formal letter from the principal investigator if the unit was or was not completed successfully at the prescribed 90 percent level and he was also given encouragement to continue with the course (see Appendix J).

12. The results of the initial field testing were accepted by the principal investigators as an indication that the utilization state of the project and further field testing were required and would serve to refine the present body of content.

13. The next phase of this project centers around initiation of an expanded field testing program to further validate the effectiveness of the modules and to prepare them for dissemination to learners desiring to develop entry-level competencies in the field of drafting.

IV. Findings

The following is a complete list of the sixteen units consisting of forty-one modules and sixteen unit tests. These units are available for review.

Unit		Module	
Number	Title	Number	Title
I	Introduction and Lettering	1 2 3 4 Unit Test	Sketching Equipment Geometric Construction Lettering Introduction and Lettering
II	Multiview Projection	1 2 3 Unit Test	Multiview I Multiview II Multiview III Multiview Projection
III	Dimensioning	1 2 3 4 Unit Test	Dimensioning I Dimensioning II Dimensioning III Tolerancing Dimensioning
IV	Working Drawings and Inking	1 2 3 Unit Test	Working Drawing I Working Drawing II Inking Drawings Working Drawings and Inking

Unit		Module	
Number	Title	Number	Title
V	Auxiliary Views and Sectioning	1 2 3 4 Unit Test	Auxiliary I Auxiliary II Sectioning I Sectioning II Auxiliary Views and Sectioning
VI	Intersections and Development	1 2 Unit Test	Intersections and Development I Intersections and Development II Intersections and Development
VII	Screws, Threads and Fasteners	1 2 Unit Test	Screw Threads Fasteners and Springs Screws, Threads and Fasteners
VIII	Pictorial Drawing	1 2 3 Unit Test	Isometric Drawings Oblique Drawings Perspective Drawings Pictorial Drawing
IX	Welding Drawing	1 2 Unit Test	Welding Representation I Welding Representation II Welding Drawings
X	Pipe Drawing	1 2 Unit Test	Piping Drawing I Piping Drawing II Pipe Drawing
XI	Electrical and Electronic Drawing	1 2 Unit Test	Electrical and Electronic Drawing I Electrical and Electronic Drawing II Electrical and Electronic Drawing
XII	Gears and Cams	1 2 Unit Test	Gears and Cams I Gears and Cams II Gears and Cams

Unit		Module	
Number	Title	Number	Title
XIII	Structural Drawing	1	Structural Drawing I
		2	Structural Drawing II
		Unit Test	Structural Drawing
XIV	Architectural Drafting	1	Architectural Drafting I
		2	Architectural Drafting II
		Unit Test	Architectural Drafting
XV	Map Drawing	1	Map Drawing I
		2	Map Drawing II
		Unit Test	Map Drawing
XVI	Charts and Graphs	1	Charts and Graphs I
		2	Charts and Graphs II
		Unit Test	Charts and Graphs

V. Conclusions

Statements characterizing conclusions revealed by the project staff as a result of efforts to this point are:

1. There is adequate and recent evidence to indicate the competencies required of entry-level draftsmen.

2. After a careful review of the literature there appear to be no other programs available to meet the educational needs to which this project is addressed.

3. The modular format and approach developed and field tested was appropriate for this project. The students were able to successfully complete the modules and unit tests. No extreme difficulties were experienced by the students, and minor changes were made when suggestions proved helpful.

4. Those participants in the initial field test demonstrated their ability to gain required competencies of entry-level draftsmen by successfully completing the unit tests of the modular program.

5. The sixteen units of instruction consisting of forty-one modules and sixteen unit examinations are now ready for the utilization stage.

APPENDIX A

ERIC ABSTRACTS

1. Search Number 0714

   Main Descriptor--Engineering Technicians

   - VT005220
   - VT005467
   - VT004942
   - VT005241
   - JC680500
   - JC680501
   - VT007171
   - VT007797
   - SE008062
   - SE008661
   - VT001308

2. Search Number 0715

   Main Descriptor--Mechanical Design Technicians

   - VT007245
   - EF003849

3. Search Number 0713

   Main Descriptor--Draftsmen

   - VT005738
   - VT007465
   - VT009618

APPENDIX B

MATERIALS SECURED

CORRESPONDENCE STUDY

Architectural Drafting. Correspondence Study. Bloomington: Indiana University, 1967.

Beginning Engineering Drawing. Independent Study. Berkeley: University of California.

Engineering Drawing. Independent Study. Berkeley: University of California.

General Drafting. Independent Study. Columbia: University of Missouri, 1968.

Industrial Arts Drafting--12A and 12B. Independent Study. Fayetteville: University of Arkansas, 1971.

Mechanical Drawing. Correspondence Study. Bloomington: Indiana University, 1968.

Mechanical Drawing. Correspondence Study. Vermillion: University of South Dakota, 1966.

Mechanical Drawing. Correspondence Study, Knoxville: University of Tennessee, 1964.

APPENDIX C

TECHNICAL SCHOOLS

J. F. McGhee, Director
Bailey Technical School
1645 Grand Boulevard
St. Louis, Missouri 63104

Anthony J. Zoeller, President
Basic Institute of Technology (B.I.T.)
1930 South Vandeventer Avenue
St. Louis, Missouri 63110

C. P. Dodge, Director
Brookfield R-III Area Technical-Vocational School
216 Linn Street
Brookfield, Missouri 64628

Gary K. Gilbert, Director, Vocational Education
Cape Girardeau Vocational-Technical School
301 North Clark
Cape Girardeau, Missouri 63701

Charles R. Boyd, Director, Technical-Vocational Education
Crowder College
Neosho, Missouri 64850

M. E. Brown
Vocational Education Department
West Plains Senior High School
West Plains, Missouri 65775

George B. Rodenheiser, Director
The David Ranken, Junior School of Mechanical Trades
4431 Finney Avenue
St. Louis, Missouri 63113

Gordon M. Finlay, President
Finlay Engineering College
7 East 79th Terrace
Kansas City, Missouri 64114

David L. Underwood, Dean of Instruction
Florissant Valley Community College
3400 Pershall Road
St. Louis, Missouri 63135

John Atkins, Director, Vocational-Technical Education
Franklin Technical School
2020 Iowa
Joplin, Missouri 64801

Sikeston Area Vocational-Technical Institute
Sikeston Public Schools
Sikeston, Missouri 63801

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Jefferson College
Box 1261
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1211 McGee Street
Kansas City, Missouri 64106

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Linn Technical College
Linn, Missouri 65051

Donald J. Welsh, Dean of Applied Arts
Metropolitan Junior College
560 Westport Road
Kansas City, Missouri 64111

Mr. Chester Smith
Penn Valley Community College
560 Westport Road
Kansas City, Missouri 64111

David H. Hart, Director
Mexico Area Vocational-Technical Schools
905 North Wade Street
Mexico, Missouri 65265

A. C. Sullivan, Jr., Dean of Acc. Ed.
Mineral Area College
Flat River, Missouri 63601

James K. Maupin, Dean of Semi-Professional and Technical Education
Missouri Southern College
Newman and Duquesne Roads
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P. O. Box 191
Monett, Missouri 65708

William P. Green, Director, Vocational-Technical Education
N. S. Hillyard Technical School
1000 South Ninth
St. Joseph, Missouri 64503

Joseph O. Carson, Dean of Instruction
Meramec Community College
959 South Geyer Road
Kirkwood, Missouri 63122

Henry C. Briesenmeister, Principal
O'Fallon Technical High School
5101 Northrup
St. Louis, Missouri 63110

Jim D. Cornett, Director, Vocational-Technical Education
Southeast Missouri Vocational-Technical School
200 Pine Street
Sikeston, Missouri 63801

David W. Berryman, Director
Springfield Board of Education
School of Technology
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Springfield, Missouri 65802

Marvin R. Fielding, Dean, Vocational-Technical Education
State Fair Community College
1900 Clarendon Road
Sedalia, Missouri 65301

R. John Reynolds, Vice-President and Education Director
Technical Education Corporation
5701 Waterman
St. Louis, Missouri 63112

APPENDIX D

COLLEGES AND UNIVERSITIES

Arizona State University
College of Engineering Science
Division of Technology
Dr. Walter E. Burdette, Director
Tempe, Arizona 85281

Northern Arizona University
School of Applied Science and Technology
Department of Industrial Education
Dr. Calvin E. James, Chairman
Flagstaff, Arizona 86001

California State College Long Beach
School of Applied Arts and Sciences
Industrial Arts Department
Dr. Irvin T. Lathrop, Chairman
Long Beach, California 90801

California State Polytechnic College
School of Engineering and Technology
Industrial Technology Department
Dr. J. Mac McRobbie, Head
San Luis Obispo, California 93401

Chico State College
Division of Industry and Technology
Department of Industry and Technology
Dr. Bill Wesley Brown, Division Chairman
Chico, California 95926

Fresno State College
School of Professional Studies
Department of Industrial Arts and Technology
Mr. Frank E. Schraeter
Fresno, California 93710

San Jose State College
School of Applied Sciences and Arts
Industrial Studies Department
Dr. Howard S. Decker, Chairman
San Jose, California 95114

Southern Colorado State College
Division of Applied Science and Technology
Area of Industrial Education and Technology
Dr. J. B. Morgan, Chairman
Pueblo, Colorado 81005

Central Connecticut State College
Division of Technology
1615 Stanley Street
Dr. Joseph W. Duffy, Director
New Britain, Connecticut 06050

Georgia Southern College
Industrial Technology Division
Industrial Arts Department
P. O. Box 8044
Dr. Donald F. Hackett, Chairman
Statesboro, Georgia 30458

Savannah State College
Division of Technical Sciences
Department of Engineering Technology
Dr. Clyde W. Hall, Chairman
Savannah, Georgia 31404

Illinois State University
College of Applied Science and Technology
Department of Industrial Technology
Dr. J. E. Talkington, Chairman
Normal, Illinois 61761

Chicago State College
Department of Industrial Education
Dr. G. Norman Laws, Chairman
Chicago, Illinois 60621

Northern Illinois University
College of Fine and Applied Arts
Department of Industry and Technology
Dr. Eckhart A. Jacobsen, Head
DeKalb, Illinois 60115

Western Illinois University
College of Applied Sciences
Industrial Education and Technology Department
Dr. Dempsey Reid, Head
Macomb, Illinois 61455

Ball State University
College of Fine and Applied Arts
Department of Industrial Education and Technology
Dr. William T. Sargent, Head
Muncie, Indiana 47306

Indiana State University
School of Technology
Dr. Lewis W. Yoho, Dean
Terre Haute, Indiana 47809

Purdue University
School of Technology
Department of Industrial Education
South Campus Courts, "A"
Dr. E. Max Eddy, Head
Lafayette, Indiana 47907

Iowa State University
College of Education
Industrial Education Curriculum
Dr. William D. Wolansky, Chairman
Ames, Iowa 50010

University of Northern Iowa
College of Natural Sciences
Industrial Arts and Technology
Dr. Howard O. Reed, Head
Cedar Falls, Iowa 50613

Kansas State College of Pittsburg
School of Technology
Department of Trade and Technical Education
Dr. Ben S. Vineyard, Chairman
Pittsburg, Kansas 66762

Eastern Kentucky University
College of Applied Arts and Technology
Industrial Education Department
Dr. Clyde O. Craft, Chairman
Richmond, Kentucky 40475

University of Maryland
College of Education
Industrial Education Department
J. M. Patterson Building
Dr. Donald Maley, Head
College Park, Maryland 20742

Central Michigan University
School of Fine and Applied Arts
Department of Industrial Education and Technology
Dr. Ernest L. Minelli, Chairman
Mount Pleasant, Michigan 48858

Farris State College
School of Teacher Education
School of Technical and Applied Arts
Trade and Industrial Education Division
Dr. William F. Van Trump, Director
Big Rapids, Michigan 49307

Wayne State University
College of Education
Department of Industrial Education
Dr. G. Harold Silvius, Chairman
Detroit, Michigan 48202

St. Cloud State College
School of Industry
Department of Industrial Education
Dr. William H. Kemp, Chairman
St. Cloud, Minnesota 56301

University of Minnesota
College of Education--Vocational-Technical Division
Industrial Education Department
125 Peik Hall
Minneapolis, Minnesota 55455

Northern Montana College
Vocational-Technical Division
Industrial Arts Department and Vocational-Technical
  Teacher Education Department
Mr. Thaddeus E. Biebel, Division Dean
Havre, Montana 59501

Glassboro State College
Department of Industrial Education and Technology
Dr. Clarence L. Heyel, Chairman
Glassboro, New Jersey 08028

Montclair State College
School of Applied Arts and Sciences
Industrial Education and Technology Department
Mr. George A. Olsen, Chairman
Upper Montclair, New Jersey 07043

Trenton State College
Division of Professional Studies
Department of Industrial Education and Technology
Armstrong Hall
Dr. Robert G. Thrower, Chairman
Trenton, New Jersey 08625

State University College at Buffalo
Applied Science and Technology
Division of Industrial Arts Education
1300 Elmwood Avenue
Dr. Kenneth L. Schank
Buffalo, New York 14222

State University College at Oswego
Division of Professional Studies
Department of Industrial Arts and Technology
Dr. Willard A. Allen
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East Carolina University
Department of Industrial and Technical Education
Box 2785
Dr. T. J. Haigwood, Chairman
Greenville, North Carolina 27834

North Carolina State University at Raleigh
School of Education
Department of Industrial and Technical Education
Dr. Durwin M. Hanson, Head
Raleigh, North Carolina 27607

University of North Dakota
College of Education
Department of Industrial Technology
Dr. A. E. Rudisill, Chairman
Grand Forks, North Dakota 58201

Bowling Green State University
College of Education
Department of Industrial Education
Dr. Jerry Streichler, Chairman
Bowling Green, Ohio 43403

Kent State University
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Van Deusen Hall
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The Ohio State University
College of Education
Academic Faculty of Industrial Technology
1712 Neil Avenue
Dr. Donald G. Lux, Chairman
Columbus, Ohio 43210

Ohio University
College of Engineering and Technology
Department of Industrial Technology
Dr. Donald E. Perry, Chairman
Athens, Ohio 45701

Southeastern State College
Division of Applied Science
Department of Industrial Education and Technology
Dr. Alvin M. White
Durant, Oklahoma 74701

Southern State College
Division of Vocational and Industrial Education
Vocation and Technical Education
Dr. Thomas C. Stone, Chairman
Springfield, South Dakota 57062

Memphis State University
Herff College of Engineering
Dr. W. T. Brooks, Director
Memphis, Tennessee 38111

Middle-Tennessee State University
School of Business and Industry
Department of Industrial Arts and Technology
Dr. Edwin S. Voorhies, Chairman
Murfreesboro, Tennessee 37130

Texas A&M University
College of Education and College of Engineering
Department of Engineering Technology
Dr. Everett R. Glazener, Head
College Station, Texas 77843

Texas Southern University
School of Technology
Industrial Education Department
Dr. Robert L. Prater
Houston, Texas 77004

Utah State University
College of Engineering
Industrial and Technical Education Department
Dr. Neill C. Slack, Head
Logan, Utah 84321

Central Washington State College
Department of Technology and Industrial Education
Dr. Ronald M. Frye
Ellensberg, Washington 98926

Western Washington State College
Department of Technology
Dr. Sam R. Porter
Bellingham, Washington 98225

Fairmont State College
Industrial-Technical Education
Mr. Dwight A. Fowler
Fairmont, West Virginia 26554

Stout State University
School of Applied Science and Technology
Industrial Teacher Education Department
Dr. Herbert A. Anderson
Menomonie, Wisconsin 54751

APPENDIX E

CURRICULUM GUIDES

Design Drafting. Curriculum Guide. Columbia: University of Missouri, 1967.

Drafting 7-12. Curriculum Guide. Minneapolis: Minneapolis Public Schools, 1968.

Drafting. Curriculum Guide. Kansas: Kansas State College of Pittsburg, 1970.

Drafting and Design Technology Programs I, II, III. Curriculum Guide. Texas: Texas Education Agency, 1971.

Drafting for Secondary Schools. Curriculum Guide. New York: Board of Education, 1963.

Highway Drawing. Curriculum Guide. New York: State Department of Education, 1968.

Map Drafting and Related Computation. Louisiana: State Vocational-Technical and Trade Schools, 1965.

Vocational Machine Drafting. Curriculum Guide. Chicago: Board of Education, 1968.

APPENDIX F

MODULE FORMAT

TITLE: ______________________________

UNIT: ______________ MODULE: ______________

Prerequisites

Directions

1. Check to see that you have satisfactorily completed all Prerequisites.
2. Read the Introduction and study the Objectives.
3. Examine the Pre-Test (See Section C) then:
    a. If you do not wish to attempt the Pre-Test, proceed in order with the Learning Experiences.

    or

    b. If you believe that you can now demonstrate the desired skill and knowledge and wish to attempt the Pre-Test, then do so at this time. If you successfully complete the Pre-Test, you may choose not to complete the module.

A. INTRODUCTION

B. PERFORMANCE OBJECTIVES

(Note: Examine the Pre-Test. If you wish to attempt the Pre-Test, then do so at this time.)

C. PRE-TEST

(Note: If you:

a. did not attempt the Pre-Test, proceed in order with the Learning Experiences.

b. attempted the Pre-Test but did not reach at least the 90% accuracy level, continue with the Learning Experiences.)

D. LEARNING EXPERIENCES

E. POST-TEST

If you did not successfully complete the Pre-Test, then complete it now as a Post-Test. If you do not achieve the 90% accuracy level, then review the Learning Experiences. After you have reviewed the Learning Experiences, repeat the Post-Test. The Pre-Post/Test is designed to provide you with information concerning your level of achievement in this module.

F. REFERENCE LIST

APPENDIX G

LIST OF EQUIPMENT

Drawing Board 20 x 24

T-square (plastic edge) 24"

45° Triangle 8"

30° - 60° Triangle 10"

Architect's Scale

Engineer's Scale

Drafting Tape

Ruby Red Eraser

Art Gum Eraser

Sandpaper Pad

Drafting Pencils (one each) 5H, 2H, F

Acme's Lettering Instrument

Erasing Shield

Irregular Curve

Protractor

Drafting Brush

Set of Drafting Instruments (must include large and small
bow compass and a divider)

APPENDIX H

RATIONALE FOR INDIVIDUALIZING INSTRUCTION

Identification of Handicapped and/or Disadvantaged Learner

While having much in common, disadvantaged and handicapped learners seem to be able to be divided into two distinct groups based on their deficiencies in regard to either the affective or psychomotor domains of learning.

Learners having deficiencies in the psychomotor domain are usually identified through the use of such quantitative data as mental ability tests, achievement tests, rank in class, health status and physical identification or handicaps. These learners (usually referred to as handicapped) may fall into one or more of the following areas:

Mentally Retarded
Hard of Hearing
Deaf
Speech Impaired
Emotionally Disturbed
Blind
Visually Handicapped
Crippled
Socially Maladjusted
Learning Disability

Learners having deficiencies in the affective domain are usually identified through the use of such qualitative data as social and cultural factors, teacher observation, community agency evaluations, surveys of parents' occupations, employment status, and educational and personal information. These learners (usually referred to as disadvantaged) may fall into one or more of the following areas of classification:

Academic
Socio-economic
Cultural
Poverty
Neglect
Delinquency
Linguistic
Ethnic
Attitude

Reasons for "Dropping Out" of Academic Environment:

Disadvantaged and handicapped learners that have "dropped out" of a structured academic environment or that have decided against pursuing further technical training usually do so because of one or more of the following factors:

Old for the grade group
Frequently ill
Small for age group
Large for age group
Failed in school one or more years
No participation in school activities
Father's occupation
Needed at home to help make a living
Educational level of parents
Divorce, death or separation of parents
Frequent school-to-school transfer
Low learning rate
Reading two years or more below grade level
Resentment of school control
Negative parental attitude toward school

Vocational Education for Handicapped Persons

It would seem appropriate to quote Earl B. Young in his introduction in the publication "Vocational Education for Handicapped Persons Handbook for Program Implementation," August, 1969, pages 2 and 3. It seems to summarize in a nutshell why an individualized course of instruction in drafting technology should be made available to handicapped persons.

> "In free societies everyone is assumed to have the right to work. Indeed, the individual is expected to work since everyone is expected to contribute to the commonwealth. Free men are expected to "know about" and to "know how to." Both of these are essential to the well-being of each person.
>
> There are certain theoretical considerations which serve as the basis for vocational education for all. Free societies can flourish when they make maximum use of their resources, both human and natural. Any individual who does not contribute his share to the socio-economic system is viewed as an economic liability. Thus, every potential worker must be trained to perform some useful service to the maximum of his capabilities. This kind of "economic realism" coupled with the philosophy of humanitarianism provides the basis for a society which is meaningful and conducive to physical and group well-being.

> Those who do not, or cannot, contribute their share to the common good must be borne by the more fortunate. It is incumbent upon any free society, however, to make certain that each person be given the opportunity to earn a living, thus making it possible for him to enjoy the "good life." Experience has shown that the disabled, when properly educated, achieve the state of well-being which is the birthright of all in free societies.
>
> All this is to say that the philosophical and theoretical foundations of all education pervade the conduct of the vocational educator and special educator as well. Working side by side, each using his special skills and knowledges, the vocational preparation of every young handicapped person can be achieved."

Handicapped Person's Needs

The handicapped person needs t know that:

He is a valued person.
He is doing things that are meaningful and significant.
He has the right to judge the worth of the product of his efforts.
He has freedom and can use it constructively.

How Handicapped and/or Disadvantaged Learners May Be Helped

Reasons for low academic achievement by handicapped and disadvantaged students in a normal academic environment are often expressed in the following ways:

Assignments too long
Have been absent often
Tests too hard
Not enough time to study
Hard for student to study
Assignments not clear
Can not study in study hall
Attention easily distracted
Can not keep up in class
Class work too hard
Not interested
Failed to hand in work on time
Bad behavior on student's part
Did not pay attention
Have not tried very hard
Did not like classmates
Did not like the teacher
Does not like to read

Difficulties Experienced in Present Learning Environment

This group of disadvantaged and handicapped individuals, who do have difficulty in learning within the normal school environment, may have one or more of the following characteristics:

- Short attention span
- Slow reaction time
- Limited power of self-direction
- Limited ability to do abstractions and to generalize
- Slow to form associations between words and ideas
- Failure to recognize familiar elements in new situations
- Habit of slow learning and forgetting quickly
- Inability to set up and realize standards of workmanship
- Lack of originality and creativeness
- Inability to analyze and solve problems or critically think and reach decisions
- Lack of power for higher mental processes

Summary

The answer to many, if not most, of these problems seems to be individualized, although directed, instruction. An individualized course of instruction in drafting technology should help to reduce the number of dropouts and overcome certain characteristics and conditions, such as the individual's size, age, past failures, home environment, personal abilities, and other conditions which have had an adverse effect upon the individual's learning success.

An individualized program will lessen distractions and allow the learner to pace himself, thus eliminating artifically imposed deadlines. Individualized pacing will deal effectively with many of the problems mentioned above. Such an individualized program can be geared to meet the individual needs of the handicapped or disadvantaged learner.

The development of wholesome attitudes, social skills and self-management skills will be built into the program so that the handicapped or disadvantaged will feel at ease in their relations with their associates. Individualized instruction also allows for immediate reinforcement. Through the use of immediate reinforcement a student can experience success. A student who has failed in the past often thinks of himself as a failure. A person who feels he is a failure becomes a failure. Successes are necessary to prevent failures. Immediate reinforcement can provide success to the student and will tend to permit him to overcome the failure syndrome.

Objective 3 indicates that the "initial design of the training program is for orally and physically handicapped." This would include the hard of hearing, deaf, speech impaired, emotionally disturbed, certain of the crippled as well as the socially maladjusted who can read and perform activities requiring reasonable dexterity. These learners need individualized instructional materials so that they may move forward at their own pace. They need to feel as if they have accomplished a task, to feel successes and not repeated failures. Such a program should assist these learners in the development of salable skills. It will permit each student to work toward his maximum potential and develop the self-confidence necessary to take advantage of employment opportunities. Wholesome attitudes on the part of the learner will be developed since he has found that he can accomplish a task because someone cared to help him.

Aids specifically required to help this group of learners to reach their goals in such a program are:

1. Very detailed explanations of tasks to be performed
2. Simple to complex illustrations
3. Slides with script or tape
   a. Script for the hard of hearing and deaf
   b. Tape for those who have reading problems
4. Single concept 8mm films with tape or sound track. (These films can be such that they will tell and show exactly how to perform a certain task. Example: using the T-square or compass.)
5. For those that have reading problems, it may be necessary to have all the directions on instruction sheets as well as on slides and tapes. Those who can read would use the script. Those who cannot read could listen to the tapes and observe illustrations. Those who have difficulty in reading could well use both tape and script as an aid to improving their reading ability.

APPENDIX I

INSTITUTE FOR EDUCATION AND TECHNOLOGY

Student Name ____________________

PROJECT NOTE

DATE ____________ TICKLER DATE ____________

PROJECT TITLE Vocational Materials Preparation PROJECT # 3

COMMENTS: DRAFTING TECHNOLOGY COURSE

This is notification that you (have) - (have not) completed

Unit ________ Module ____________ with a ________ accuracy.

Please continue with Unit ____________ Module ____________.

____
Signature

edutek
incorporated

INSTITUTE FOR
EDUCATION AND TECHNOLOGY

APPENDIX J

April 28, 1972

Dear Randy:

I have just completed evaluating your Unit II examination. Your work on the unit exam was very satisfactory (95% correct.)

One of the objects you completed (from the test--not the text) was a cylindrical object which requires only two views. In this case, the top view is not needed.

Thank you for your comments concerning the directions for the unit test. As a result of your comments, the directions have been improved.

Keep up the good work in the next unit.

Cordially,

F. Milton Miller
Assistant Professor of
Industrial Education

FMM:elb

edutek
incorporated
Ninth and Avenue H 1340 Air Park West Lincoln, Nebraska 68524 402-799-2447

INSTITUTE FOR
EDUCATION AND TECHNOLOGY

April 17, 1972

Dear David:

I have just completed reviewing your Unit I examination on "Introduction and Lettering". I am happy to report that you successfully completed the Unit Test with 95% accuracy.

In answer to your question concerning the use of drafting equipment and books during the unit exam--this is permissible. You have completed Unit I in an outstanding manner, please continue with Unit II and continue the good work.

Cordially,

F. Milton Miller
Assistant Professor of
Industrial Education

FMM:elb

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Ninth and Avenue H 1340 Air Park West Lincoln, Nebraska 68524 402-799-2447

130/131

PROJECT 4

PREPARATION OF CURRICULAR MATERIALS FOR TRAINING OF VOCATIONAL-TECHNICAL TEACHERS

PROJECT INVESTIGATORS
J. Horner, R. Peterson, R. Dillon, R. Douglass, J. Bikkie,
H. Crain, D. Zikmund, S. Eggland

PROJECT PERIOD
July 1, 1971 - June 30, 1972

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incorporated
INSTITUTE FOR
EDUCATION AND
TECHNOLOGY

Ninth and Avenue H
1340 Air Park West
Lincoln, Nebraska 68524

USOE Contract No.: OEC-0-71-1253
EDUTEK, Inc.

PROJECT #4

ANNUAL REPORT

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I. Purpose:

The purpose of this project was to develop curricular materials for training of vocational-technical teachers. There is a shortage of adequately prepared professional vocational-technical instructional personnel in both quantity and quality. Common competencies required of all vocational -technical teachers need to be identified; and directed-individualized-instructional, mediated curriculum materials need to be developed and made available.

II. Objectives:

The project objectives were to:

1. Design prototypes of competency-based, directed-individualized-instructional programs for preparation of professional vocational-technical personnel in the areas of Methods of Instruction, Program Planning and Evaluation, and Coordination Techniques.
2. Develop curriculum materials and practical experiences for the prototypes in objective 1.
3. Determine initial acceptability of the design and curriculum for certification or endorsement.

III. Methodology:

The objectives were accomplished under the following steps:

A. A team from all vocational-technical areas was assembled to identify and review the competencies common to all vocational-technical areas. The areas represented were Method of Instruction, Program Planning and Evaluation, and Coordination Techniques.

B. Factors were identified and isolated as those being basic to the development of the prototypical modules included in the project. These are:

1. Competency-based instruction
2. Core curriculum for all vocational-technical service
3. Individualized independent study
4. Frequent application and practice
5. Mediated instructional materials
6. Preparation of non-traditional vocational educators for new career education programs
7. Applicable for pre-service and in-service teacher education
8. Opportunities to enter and exit at various points

9. Recognition of the facets of the vocational teacher preparation curriculum, i.e.:
    a. Selection of students
    b. Technical education
    c. General education
    d. Guidance
    e. Vocational student organization
    f. Professional role
    g. School/community relationships
    h. Philosophies and attitudes

C. A list of competencies that were common to all vocational-technical teachers was developed.

D. The competencies were identified and developed within the various modules.

E. The modules developed under this project were organized under the following outline:

1. Methods of Instruction
    a. The Advantages or Disadvantages Method of Problem-Solving Teaching
    b. Questioning Skills
    c. Establishing Set
    d. Achieving Closure
    e. Utilizing Games
    f. Possibilities and Factors Method of Problem-Solving Teaching
    g. Individualized Teaching Techniques
    h. The Present Situation Compared to the Ideal Situation Method of Problem-Solving Teaching

2. Program Planning and Evaluation

    a. Planning a Community Analysis
    b. Development of Curriculum
    c. Planning the Use of Facilities for Vocational Education

3. Coordination Techniques

    a. Identifying the Role and Function of an Advisory Committee
    b. Selection of Advisory Committee Members
    c. Operation of an Advisory Committee
    d. Organizational Patterns for Advisory Committees

F. Existing instructional packaging and sequencing procedures were reviewed.

G. The Model Curricula for Vocational and Technical Teacher Education project staff at the National Center for Vocational Technical Education was consulted, and efforts were made to coordinate and develop the module design of Project 4 with the module design at the Ohio Center.

H. The following aspects of the module format for prototype development were agreed upon:

   1. Each module should include a listing of assessment tasks (performance tasks or competencies).

   2. Under each assessment task several developmental tasks (sub-tasks) may be included.

   3. The assessment tasks and developmental tasks should be arranged in a schematic lattice structure to facilitate sequencing a student through the module.

I. Three sub-committees developed competency-based, directed-individualized-instructional prototypes under the outlines described in section E. 1,2, and 3 on page

IV. Project Outcomes:

The product of this project is a number of modules. Each module has a similar format which includes (a) a brief introduction, (b) behavioral objectives, (c) pre-assessment, (d) references, (e) integral mediated materials, (f) instructions for completing the module, and (g) post-assessment.

The basis for each module is a single concept, a competency, group of competencies, or an independent segment of subject matter required by persons preparing for careers as vocational-technical education personnel. This structure greatly increases utility of the modules since they are not specific to any one teacher education program.

This approach was also determined to be acceptable with reference to certification or endorsement for the preparation of professional vocational-technical personnel.

On the following pages is an itemization of the contents of the prototypes. Sample modules are available for inspection.

AREA 1

Methods of Instruction

Title: The Advantages or Disadvantages Method of Problem-Solving Teaching

Module No.: 1 - A

Objectives:

1. To construct a lesson plan using the advantages vs. disadvantages method of teaching, including the components of a lesson plan, on a daily lesson plan form.

2. To demonstrate the teaching of a lesson using the advantages vs. disadvantages method of problem-solving in the micro-teaching laboratory.

3. To construct an assessment task for the advantages vs. disadvantages lesson taught by the student teacher.

Integrated Resources:

1. Mimeographed materials:
   a. "The Problem Approach in Teaching"

2. Audiotapes:
   a. "The Advantages or Disadvantages Method of Teaching"

3. Videotapes:
   a. "The Advantages or Disadvantages Method of Teaching"

4. A "Daily Lesson Plan" form

AREA 1

Methods of Instruction

Title: Questioning Skills

Module No.: 1 - B

Objectives:

1. To differentiate between organizational questions and content questions.
2. To prepare a question suitable for each of ten given functions of questions.
3. To classify content questions by level in the cognitive domain.
4. To demonstrate the teaching of a lesson using questioning skills.

Integrated Resources:

1. Mimeographed materials:
   a. "Affective Domain"
   b. "Cognitive Domain"
   c. "Factors Influencing Questioning"
   d. "Organizational and Content Questions"
   e. "Psychomotor Domain"
   f. "Questioning"
2. Audiotapes:
   a. "Functions of Questions"
3. Videotape recording equipment and place for recording the teaching of a mini-lesson.

AREA 1

Methods of Instruction

Title: Establishing Set

Module No.: 1 - C

Objectives:

1. To identify, by listing, the four segments of a lesson.
2. To analyze examples of set to determine the purpose and function of each.
3. To demonstrate the use of set to open a lesson.
4. To demonstrate the teaching of a lesson using the establishment of set when appropriate.

Integrated Resources:

1. Mimeographed materials:
   a. "The Segments of a Lesson"
   b. "Situations for Home Economics"
2. Audiotapes:
   a. "Some Ways of Establishing Set"
3. Set of 17 cards containing examples of set
4. Videotape recording equipment, tape, and room for taping (optional)

AREA 1

Methods of Instruction

Title: Achieving Closure

Module No.: 1 - D

Objectives:

1. To identify the four segments of a lesson.
2. To analyze examples of closure to determine the purpose and functions of each.
3. To demonstrate the use of closure to end a lesson.
4. To demonstrate the teaching of a lesson using the achievement of closure when appropriate.

Integrated Resources:

1. Mimeographed materials:
    a. "The Segments of a Lesson"
    b. "Suggestions for Achieving Closure"
2. Audiotapes:
    a. "Achieving Closure"
3. Videotape recording equipment, tape, and room for taping (optional)

AREA 1

Methods of Instruction

Title: Utilizing Games

Module No.: 1 - E

Objectives:

1. Differentiate among games of skill, games of chance, and games of strategy.
2. Analyze gaming as a simulation situation for learning.
3. Evaluate an academic game using synthesized criteria.
4. Demonstrate competence to direct an academic game within a total learning situation.

Integrated Resources:

1. Mimeographed materials:
   a. "Cone of Experience"
   b. "Types of Games"
2. Audiotapes:
   a. "Gaming as a Form of Simulation"
3. Games provided:
   a. Better Meals Game
   b. Consumer Carrousel
   c. Cookie Scramble
   d. Food Preparation Terms
   e. Housing the Family
   f. Indian Valley
   g. Management Roulette
   h. Money Game
   i. Teenager Grows Toward Maturity

   Games available commercially:
   a. Ghetto
   b. Managing Your Money

Reference Materials:

1. Abt, Clark C. "Games for Learning". (Occasions Paper No. 7). Cambridge, Massachusetts: Educational Services Incorporated, 1966.
2. Dale, Edgar. Audiovisual Methods in Teaching. New York: The Dryden Press, Third Edition, 1969. pp. 238-239.

Reference Materials:

3. Fleck, Henrietta. Toward Better Teaching of Home Economics. New York: The Macmillan Company, 1968. pp. 158-159.

4. Hall, Olive and Paolucci, Beatrice. Teaching Home Economics. New York: John Wiley & Sons, Inc., Second Edition, 1970. pp. 311-315.

AREA 1

Methods of Instruction

Title: The Possibilities and Factors Method of Problem-Solving Teaching

Module No.: 1 - F

Objectives:

1. To construct a lesson plan using the possibilities and factors method of teaching including the components of a lesson plan on a daily lesson plan form.
2. To demonstrate the teaching of a lesson using the possibilities and factors method of problem solving in the micro-teaching laboratory.
3. To construct an assessment task for each objective in the possibilities and factors lesson taught by the student teacher.

Integrated Resources:

1. Mimeographed materials:
   a. "The Problem Approach of Teaching" by H. W. Deems, revised, 1972, by R. L. Peterson
2. Audiotapes:
   a. "The Possibilities and Factors Method of Teaching"
3. Videotapes:
   a. "The Possibilities and Factors Method of Teaching"
4. "Daily Lesson Plan" form

AREA 1

Methods of Instruction

Title: Individualized Teaching Techniques

Module No.: 1 - G

Objectives:

1. To name the essential features of individualized instruction.
2. To construct a series of self-instructional lesson plans designed so that an individual student may master a specific skill or competency in an independent study situation.

Integrated Resources:

1. Mimeographed materials:
    - a. "How Much Wood Could a Woodchuck Chuck If It's In Board Feet?"
    - b. "How to Write a UNIPAC"
    - c. "What Procedure Should We Follow in Writing a UNIPAC?"
2. Audiotapes:
    - a. "Individualizing Instruction"

AREA 1

Methods of Instruction

Title: The Present Situation Compared to the Ideal Situation Method of Problem-Solving Teaching

Module No.: 1 - H

Objectives:

1. To construct a lesson plan using the present situation compared to the ideal situation method of teaching, including the components of a lesson plan on a daily lesson plan form.

2. To demonstrate the teaching of a lesson using the present situation compared to the ideal situation, in the micro-teaching laboratory.

3 To construct an assessment task for each objective in the present situation vs. the ideal situation lesson taught by the student teacher.

Integrated Resources:

1. Mimeographed materials:
   a. "The Problem Approach in Teaching"

2. Audiotapes:
   a. "The Present Situation Compared to the Ideal Situation Method of Teaching"

3. Videotapes:
   a. "The Present Situation Compared to the Ideal Situation Method of Teaching"

4. A "Daily Lesson Plan" form

AREA 2

Program Planning and Evaluation

Title: Planning a Community Analysis

Module No.: 2 - A

Objectives:
1. Given a listing of the types of information needed for a community analysis and several sample forms, the student will outline a plan for securing information concerning employment needs, student needs, and community needs. The plan must include a listing of:
    a. the types of information desired,
    b. the probable persons and/or agencies from which the data could be obtained, and
    c. steps describing how each type of information would be obtained.

Integrated Resources:

1. Mimeographed materials:
    a. "Occupational Opportunities in Nebraska--1971 Report"
    b. Audiotape narration for "Planning a Community Analysis"
    c. "Procedure for Determining Vocational Education Needs Through Community Analysis"
    d. "What I Should Know About My School District"
    e. Sample of "Applied Biological Science Interest Inventory" (available from Interstate Printers, Danville, Illinois)
    f. Sample of student "Follow-Up Record" form
    g. Sample of "Observation of Community" forms from Eagle School District
    h. Sample of "Personal Data" forms
    i. Sample of "Situation Statement" forms
    j. Sample of "Survey of Distributive Job Opportunities" forms
2. Audiotapes:
    a. "Planning a Community Analysis"

Reference Materials:

1. United States Census of Agriculture, Vol. 1, Part 20, Nebraska.
2. United States Census of Population, 1970, Final Report.
3. United States Census of Population, 1970, Nebraska.

AREA 2

Program Planning and Evaluation

Title: Development of Curriculum

Module No.: 2 - B

Objectives:
1. To examine the foundations for developing curriculum.
2. To list the elements of curriculum.
3. To illustrate the interrelationship of the elements of curriculum.

Integrated Resources:

1. Mimeographed materials:
   a. "Basic Elements of Curriculum"
   b. "Development of Curriculum" (model)
   c. "Philosophical Foundations"
   d. "Psychological Foundations"
   e. "Sociological Foundations"
   f. "Subject Matter as Foundation"
2. Audiotapes:
   a. "Overview of Development of the Curriculum"

AREA 2

Program Planning and Evaluation

Title: Planning the Use of Facilities for Vocational Education

Module No.: 2 - C

Objectives:

1. Given a floor plan template and a "to-scale" kit of equipment and facilities cutouts, the teacher will layout the walls, and arrange the facilities and equipment on the template, based on an example school situation.
2. The teacher will describe the reasons for his decisions in organizing the facilities and equipment, based on the example situation.

Integrated Resources:

1. Mimeographed materials:
   a. Audiotape narration for "Planning Facilities for Vocational Education"
   b. "Recommendations For Facilities to be Used in Teaching Vocational Agriculture in High Schools"
2. Audiotapes:
   a. "Planning Facilities for Vocational Education"
3. Kit provided:
   a. Kit of "to-scale" items to be included in the simulation kit
   b. "To-scale" template for teacher simulation planning

Reference Materials:

1. Buildings, Equipment, and Facilities for Vocational Agriculture Education, U. S. Department of Health, Education, and Welfare, Office of Education OE-81003, 1960; Government Printing Office, Washington.
2. Developing Educational Specifications for Vocational and Practical Arts Facilities, American Vocational Association.
3. Facilities for Instruction in Ornamental Horticulture, The Pennsylvania State University, Department of Agricultural Education, Teacher Education Series, Volume 12, No. 3, 1971.
4. Handbook on Teaching Vocational Agriculture, Lloyd J. Phipps, Danville, Illinois: Interstate Printers, 2nd Edition, 1970.

AREA 2 - Program Planning and Evaluation
Title: Planning the Use of Facilities for Vocational Education
Module No.: 2 - C (cont'd)

Reference Materials:

5. List of Tools and Equipment for Teaching Vocational Agriculture, University of Nebraska, Agricultural Education Department.

6. Vocational Agriculture Building and Facilities Check List, University of Minnesota, Department of Agricultural Engineering, FB 167.

7. Vocational Agriculture Building Floorplans for One-Man, Two-Man, and Three-Man Vocational Agriculture Departments, State of Minnesota, Agricultural Education Unit, Department of Education, 1968.

AREA 3

Coordination Techniques

Title: Identifying the Role and Function of an Advisory Committee

Module No.: 3 - A

Objectives:

1. List the functions of an advisory committee.
2. Construct a rationale statement for the formation of an advisory committee.
3. Define the term or concept "advisory committee".
4. Identify the authority of an advisory committee.

Integrated Resources:

1. Mimeographed materials:
    a. Audiotape script for "Definition of an Advisory Committee"
    b. Audiotape script for "Role and Function of Advisory Committees"
    c. Audiotape script for "Role of the Advisory Committee with Respect to Program Evaluation"
2. Audiotapes:
    a. "Definition of an Advisory Committee"
    b. "Role and Function of Advisory Committees"
    c. "Role of the Advisory Committee with Respect to Program Evaluation"

Reference Materials:

1. "The Advisory Committee and Vocational Education", American Vocational Association, Washington, D.C., 1969.
2. "Handbook on Planning and Conducting Cooperative Occupational Education Programs in Off-Farm Agricultural Occupations". Miscellaneous Publication 19, University of Nebraska, Lincoln, Nebraska, revised 1971.
3. Kaufman, Jacob J., et al., The Role of the Secondary Schools in the Preparation of Youth for Employment. Institute for Research on Human Resources, The Pennsylvania State University, University Park, Pennsylvania, 1967.
4. "Wise Use of an Advisory Council", University of Nebraska, Lincoln, Nebraska. (Mimeographed). n.d.

AREA 3

Coordination Techniques

Title: Selection of Advisory Committee Members

Module No.: 3 - B

Objectives:

1. Outline the criteria for selecting advisory committee members.
2. Determine the procedure for selecting and appointing advisory committee members.

Integrated Resources:

1. Mimeographed materials:
    a. Audiotape script for "Contributions of Advisory Committee Members Who are Active, Indifferent, or Passive"
    b. Audiotape script for "Selecting Persons to Serve on an Advisory Committee"
    c. Audiotape script for "Items to Consider When Selecting Persons to Serve on an Advisory Committee"
    d. Storyboard for slide-tape presentation "Kinds of People to Include on an Advisory Committee"
2. Audiotapes:
    a. "Contributions of Advisory Committee Members Who are Active, Indifferent, or Passive"
    b. "Selecting Persons to Serve on an Advisory Committee"
    c. "Items to Consider When Selecting Persons to Serve on an Advisory Committee"
3. Slide-tape presentations:
    a. "Kinds of People to Include on an Advisory Committee"

Reference Materials:

1. "The Advisory Committee and Vocational Education", American Vocational Association, Washington, D.C., 1969.
2. "Wise Use of an Advisory Council", University of Nebraska, Lincoln, Nebraska. (Mimeographed). n.d.

AREA 3

Coordination Techniques

Title: Operation of an Advisory Committee

Module No.: 3 - C

Objectives:

1. To develop, select, or modify a brochure suitable for orienting advisory committee members to their duties and responsibilities.
2. Identify the duties of advisory committee officers.
3. Determine the number of meetings to be held per year.
4. Determine appropriate locations for advisory committee meetings.
5. Review a constitution and by-laws for an advisory committee.

Integrated Resources:

1. Mimeographed materials:
   a. "Operator's Manual for Vocational Education Advisory Committee"
   b. Selected reference "Sample Constitution and By-Laws for a Vocational Advisory Committee"
   c. Audiotape script for "Developing a Brochure for New Advisory Committee Members"
   d. Audiotape script for "Criteria for Scheduling Advisory Committee Meetings"
   e. Audiotape script for "Advisory Committee Member Rotation"
   f. Audiotape script for "Number and Selection of Advisory Committee Officers"
2. Audiotapes:
   a. "Developing a Brochure for New Advisory Committee Members"
   b. "Criteria for Scheduling Advisory Committee Meetings"
   c. "Advisory Committee Member Rotation"
   d. "Number and Selection of Advisory Committee Officers"

Reference Materials:

1. "The Advisory Committee and Vocational Education", American Vocational Education, Washington, D.C., 1969.

AREA 3 - Coordination Techniques
Title: Operation of an Advisory Committee
Module No.: 3 - C (cont'd)

Reference Materials:

2. "Handbook on Planning and Conducting Cooperative Occupational Education Programs in Off-Farm Agricultural Occupations", Miscellaneous Publication 19, University of Nebraska, Lincoln, Nebraska, revised 1971.

3. "Wise Use of an Advisory Council", University of Nebraska, Lincoln, Nebraska. (Mimeographed). n.d.

AREA 3

Coordination Techniques

Title: Organizational Patterns for Advisory Committees

Module No.: 3 - D

Objectives:

1. Given the terms "horizontal or general advisory committee", "departmental advisory committee", and "vertical or craft advisory committee", the learner will be able to define each either orally, in writing, or by demonstration.
2. Given a diagram and essential information for an advisory committee, the learner will be able to determine whether it is a horizontal or general, departmental, or a vertical or craft advisory committee organization, either orally or in writing.
3. Given a teacher-coordinator, other teacher in the school system, school administrator, or school board members, the learner will be able to explain the role of each in relation to an advisory committee, either in writing or orally.
4. Given an actual or simulated school situation, the learner will be able to diagram the appropriate advisory committee organization for this situation.
5. Given a self-administered pretest, the learner will be able to score 20 of a possible 24 points.
6. Given a simulated or actual school setting which includes an advisory committee, the learner will be able to identify the role of the advisory committee in relation to the total school organization.

Integrated Resources:

1. Mimeographed materials:
    a. Selected reference "Definition of a Vertical or Craft Advisory Committee"
    b. Selected reference "Organizational Patterns of Advisory Committees"
    c. Selected reference "Roles of the Teacher-Coordinator, Other Teachers, School Administrators and School Board Members in Relation to the Advisory Committee"
    d. Audiotape script for "Definition of a Craft or Vertical Advisory Committee"

AREA 3 - Coordination Techniques
Title: Organizational Patterns for Advisory Committees
Module No.: 3 - D (cont'd)

Integrated Resources:

1. Mimeographed materials:
    - e. Audiotape script for "Brief Overview of Local, State and National Advisory Committee Organization"
    - f. Audiotape script for "Brief Overview of Three Levels of Local Advisory Committee Organizational Structures"
    - g. Slide-tape presentation outline for "Advisory Committee"

2. Audiotapes:
    - a. "Definition of a Craft or Vertical Advisory Committee"
    - b. "Brief Overview of Local, State and National Advisory Committee Organization"
    - c. "Brief Overview of Three Levels of Local Advisory Committee Organizational Structures"

3. Slide-tape presentations:
    - a. "Advisory Committee"

PROJECT 5

MEDIA INSTITUTE MATERIALS PREPARATION

PROJECT PERIOD
July 1, 1971 - June 30, 1972

PROJECT INVESTIGATORS
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PROJECT #5

ANNUAL REPORT

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I. Purpose:

The purpose of this project is to develop a competency-based, self-directed instructional system for the education and training of media professionals and people interested in the field of instructional technology. We have broken this goal down into three parallel thrusts: first, to state the competencies required of a job in discrete, behavior oriented objectives; second, to create Instructional Media Packaged Activities and Competency Tests (IMPACTs) for each objective; and third, to create a storage and retrieval system for the implementation and dissemination of these IMPACTs.

II. Methodology:

One of the chief concerns of any career field is the education and training of its members. Traditionally, course credits and seniority on the job have sufficed as indicators of the educator's expertise. Today, however, in their clamor for a more precise accounting of educational efficiency, the various publics of education are insisting that the educator's professional license be based upon performance and competency, rather than on credits or time-on-the-job.

The pursuit of a competency-based evaluation of the media professional has drawn into even sharper focus the need to define who the media professional is, what he does, and what gets done.

Silber's "Domain of Instructional Technology" (10) has cast new light on the perennial debate which asks the question, "Who are we"? It has taken a fresh look at the various compoments of an instructional system (man, materials, devices, messages, techniques, and settings); groups the instructional functions necessary to develop and support these components (research-theory, design, project questions, evaluation-selection, support-supply, utilizing, and utilization for dissemination); and provides for the management (organization, personnel) of those functions and components.

Utilizing Silber's Domain of Instructional Technology in whole and in part, two very significant studies have emerged to even more precisely describe the media professional: the Jobs in Instructional Media Study (5) and Media Guidelines (6). A third and concurrent study, the Knapp School Library Manpower Project (9) bears a remarkable resemblance to the first two studies; a fact that, as much as anything else, points to the strong parallel line between the library and audio-visual career fields (8).

Believing that media jobs or tasks can be described in terms of "Who does what" and "What gets done," the JIMS utilized the techniques of "functional job analysis", as used by the U.S. Department of Labor, to observe and record the activities and characteristics of media workers. The categorization of these findings has provided a beginning conceptual scheme for describing: (1) what kind of worker (e.g. aide, technician, specialist), (2) operates in what functional area (e.g. production, research, etc). These findings suggest that a whole range of media tasks could be specified for the several media functions and levels of workers, and further, that an entire pattern of job descriptions, career training, and certification could be based upon a competency-oriented instructional system for the media worker.

It must have been with similar conclusions that, at about this same time, Syracuse University was prompted to create the "Curriculum Development Institute." This project undertook to spell out media competencies for the nine DIT functions and to suggest a curriculum relating to the attainment of these competencies.

It was extremely fortuitous that these events had occurred just prior to the inception of Project #5. The concepts generated by the DIT, the JIMS, and the CDI appeared to have provided the necessary base upon which to build a sound, sensible, systematic, competency-based instructional program.

Perhaps for the first time in our half-century existence, there now existed a well-designed and understandable pattern of occupational relationships among the many subgroups who legitimately claim membership in the field of Instructional Technology.

It is for this reason then, that Project #5 chose to build upon the excellent foundation of these recent and timely investigations.

It was envisioned that: (1) the DIT would provide a solid philosophical base; (2) the JIMS would provide the task-oriented relationships between workers and functions; and (3) the CDI would assist in ferreting out the task objectives and the competency profiles of our career field.

A survey of existing materials and programs of instruction, designed or suggested for the training of the media worker, revealed not only: (1) an abundance of materials in several functions and a paucity of materials in other functions, but also (2) a gross lack of materials which could effectively be used in a systematic, individualized manner. For that matter, it was noted that scarcely any material, whether for group or individual use, was fashioned to be used in a systematic way, i.e. from a statement of objectives, through strategy implementation, to competency assessment.

The need and product for this project was clearly seen: a series of competency-based instructional modules for the training of the media worker.

III. Procedure:

The first order of business in the development of instructional modules was to be certain of the philosophical base upon which the project was to be built. Through a series of discussions between the project co-investigators, project assistant and the EDUTEK administrative staff, a set of goals and procedures was outlined. In so doing, it was discovered that several parameters were necessary to define the scope and limitations of the project:

(a) The project should be broad enough to have applicability to the whole spectrum of media workers. Rather than limiting its concern to the Media Specialist in a K-9 situation, it should embrace the needs of secondary, college and university personnel, and possibly those media workers outside the structures of formal education (e.g. business, military, religion).

(b) Although there is a myriad of titular nomenclature for media workers ranging from aide through media-generalist, it was decided to accept the JIMS three-level worker designators: entry level, middle level, and advanced level.

(c) While recognizing that peer competencies (e.g. a technician working with teachers should have some "feel" for teaching skills) are necessary for the media worker, it seemed too monumental a task, and even an inappropriate one, to tackle in this project.

(d) A very logical part of an instructional module program would be a contingent accreditation or certification plan. While such a system should be suggested and encouraged, it was felt to be outside the purview of this project.

A Project Plan was developed which consisted of six phases as follows:

PHASE I - Survey the literature related to the identification of competencies required of a media worker.

PHASE II - Identify competencies required of the media worker.

A. Identify and classify objectives (and related competencies) in relation to job levels and instructional functions (Appendix A).

B. Using a "panel of experts", review and revise these objectives and competencies.

PHASE III - Identify, review, and classify resources designed to teach the specific media competencies.

A. Using research assistants or contracted services, locate existing resources.

B. Develop a classification system capable of computer retrieval.

C. Using a "panel of experts", review and revise these resources and the retrieval system.

D. Suggest the development of resources to serve as instructional aids for specific competencies where these resources do not already exist.

PHASE IV - Develop a standard format for an individualized instructional module.

A. Review and revise this format with the "panel of experts".

B. Prepare prototype instructional modules.

C. Test those prototype modules on selected subjects.

D. Review and revise these modules.

PHASE V - Field test selected modules to a wider audience.

PHASE VI - Promulgate successful modules and continue the development of others.

It soon became apparent that because of the complexity of the project and the limitations of staff and investigator time, an adjustment in the project's aspirations was necessary. This reassessment resulted in a more realistic set of objectives. A summary of these objectives and general progress on them* follows.

---

* Specific data and materials were generated in response to these objectives and are detailed in the appendices of this report.

IV. Objectives and Outcomes

The objectives for this project and their outcomes are:

1) To survey literature related to the identification of competencies required of media practitioners so as to establish a philosophical and theoretical base upon which to begin a system of competencies. (Upon completion of the survey of literature, it was decided that this project would be built upon the task oriented "Jobs in Instructional Media Study", the philosophical basis of the Domain of Instructional Technology and the competency profile of the "Curriculum Development Institute").

2) To identify competencies required of personnel working in the field of Instructional Technology. (The JIMS study divides the field of Instructional Technology into nine functional areas; each area is in turn divided into three describable levels: entry, middle and advanced level. We have taken one of the nine functions, the Design Function, and written objectives for both the middle and advanced levels. These objectives may be found in Appendices A and B. Now that a system for breaking these objectives out of the JIMS task inventory has been developed, we hope to complete the other eight functions next year).

3) To identify and review resources designed to teach specific competencies in the field of Instructional Technology. (This year we have identified approximately 2,000 sources for the Design Function. These sources were discovered through a search of ERIC documents from 1960 to the present, the Syracuse University Library and the University of Nebraska Library. Later this summer, these sources will be reviewed and revised by a panel of media practitioners selected for this purpose. It is anticipated that additional materials for each function will need to be developed by EDUTEK as we proceed.

4) To develop a standard format for the Instructional Modules used to teach the competencies identified in Objective 2. (This format has been developed and may be reviewed. The modules are called IMPACTs, which stands for Instructional Mediated Packaged Activities and Competency Tests. As we view our task, most of next year's activity will involve the construction of these IMPACTs).

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3. Butz, Margarete. "A Systematic Approach to Developing Curriculum in the Domain of Instructional Technology", Audiovisual Instruction, Volume 16, No. 6, June/July, 1971, p. 73-75.

4. Hamreus, Dale. "Media Guidelines", Audiovisual Instruction, Volume 15, No. 5, May, 1970, pp. 31-34.

5. "Jobs in Instructional Media", AECT, Washington, D.C., November, 1969.

6. "The Media Guidelines Project", U.S. Department of Health, Education, and Welfare, Office of Education, Monmouth, Oregon, June, 1970.

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8. Oglesby, William. "A Reason for Peace", Audiovisual Instruction, Volume 16, No. 6, June/July, 1971, pp. 70-72.

9. "School Library Manpower Project", American Library Association, Chicago, Illinois, 1970.

10. Silber, Kenneth. "What Field Are We In, Anyhow?", Audiovisual Instruction, Volume 15, No. 5, May, 1970, pp. 21-24.

APPENDIX A

Introduction to Advanced Level Behavioral Objectives

These objectives were derived by combining several sources. Those sources are:

1. Advanced level training procedures developed by John Johnson and Dennis Myers at Syracuse University.
2. Worker Instruction levels developed by Sidney Fine of Upjohn Institute and used by the JIMS project staff
3. The Data, People and Things scales used by the JIMS project staff
4. The task analysis data gathered by the JIMS project staff

The topics, or learning goals, for which objectives have been formulated are taken directly from the JIMS task analysis data as are the majority of the "representative tasks" cited below the objectives. All learning goals from the Design function (advanced level) and all tasks related to these goals have been utilized in this collection of objectives. No pretense is made about the completeness of this set of objectives, and certainly the author wishes the reader to know that he recognizes that these objectives are little more than a "drop in the bucket" as far as a total data bank of objectives in the Design function is concerned. However, this listing of objectives is a beginning step toward gathering a mass of never-ending information and objectives which truly will represent the Design function.

The format of the units of objectives is repetitive -- by design. Eventually these objectives will be stored in such a manner that a learner may retrieve any learning goal which he feels is important to him and full information on the accomplishment of that goal must be available to him. For that reason (also because the required responsibility levels, data skills, people skills, things skills and required General Educational Development levels from goal to goal) each learning goal is preceeded by an explanation of what levels of expertise are required of the learner before he may accomplish his learning goal. This explanation describes, in detail, the required responsibility level, the required level of competency in dealing with data, people and things as well as the required general education levels in reasoning, mathematics and language.

With the exception of a complete set of "Advanced Level Training Procedures" all the raw data used to derive these objectives can be found in the Jobs in Instructional Media final report by Anna Hyes, et.al., published by the Division of Educational Technology, National Education Association, 1201 Sixteenth Street N.W., Washington, D. C., in September of 1971.

ADVANCED LEVEL

BEHAVIORAL OBJECTIVES DERIVED FROM JIMS PROJECT TASK ANALYSIS DATA (DESIGN FUNCTION) AND ADVANCED LEVEL TRAINING PROCEDURES

Pre-requisite behavior: Given the advanced level procedures for task performance, the learner will state the importance of performing each procedure.

Learning Goal 4.01; to design instructional materials for a course:

Required responsibility level: Various possible outputs are described that can meet stated technical or administrative needs. The worker must investigate the various possible outputs and evaluate them in regard to performance characteristics and input demands. This usually requires his creative use of theory well beyond referring to standard sources. There is no specification of inputs, methods, sequences, sources, or the like.

Required data skills: ANALYZING: The learner is able to examine and evaluate data (about things, data, or people) with reference to the criteria standards, and/or requirements of a particular discipline, art, technique, or craft to determine interaction effects (consequences) and to consider alternatives.

COORDINATING: The learner is able to decide time, place, and sequence of operations of a process, system, or organization, and/or the need for revision of goals, policies (boundary conditions), or procedures, on the basis of analysis of data and of performance review of pertinent objectives and requirements. Includes executing decisions and/or reporting on events.

Required people skills: TAKING INSTRUCTIONS-HELPING: The learner is able to attend to the work assignment, instructions, or orders of supervisors. No immediate response or verbal exchange is required unless clarification of instruction is needed.

CONSULTING: The learner is able to serve as a source of technical information and give such information or provides ideas to define, clarify, enlarge upon, or sharpen procedures, capabilities, or product specifications.

INSTRUCTING: The learner is able to teach subject matter to others, or train others, including animals, through explanation, demonstration, practice, and test.

TREATING: The learner is able to act on or interact with individuals or small groups of people or animals who need help (as in sickness) to carry out specialized therapeutic or adjustment procedures. Systematically observes results of treatment within the framework of total personal behavior because unique individual reactions to prescriptions (chemical, physician's, behavioral) may not fall within the range of prediction. Motivate, support, and instruct individuals to accept or cooperate with therapeutic adjustment procedures, when necessary.

Required General Educational Development:

1. The learner must:

* Have knowledge of a field of study (engineering, literature, history, business administration) having immediate applicability to the affairs of the world.

* Define problems, collect data, establish facts, and draw valid conclusions.

* Interpret an extensive variety of technical material in books, manuals, texts, etc.

* Deal with some abstract but mostly concrete variables.

2. The learner must be able to count to simple addition and subtraction; read, copy, and/or record figures.

3. The learner must:

* Have language ability to take and transcribe dictation, make appointments, and sort, route, and file the mail according to subject.

* Write routine business correspondence reflecting standard procedures.

* Interview job applicants to determine work best suited for their abilities and experience; contact employers to interest them in services of agency.

* Understand technical manuals and verbal instructions, as well as drawings and specifications, associated with practicing a craft.

* Guide people on tours through historical or public buildings, tell relevant anecdotes, etc.

* Conduct opinion research surveys involving stratified samples of the population.

The learner must:

* Report, write, or edit articles for magazines which, while popular, are of a highly literate nature (e.g., The New Yorker, Saturday Review, Scientific American.)

* Prepare and deliver lectures for audiences that seek information about the arts, sciences, and humanities in an informal way.

* Report news for the newspapers, radio, or TV.

* Write copy for advertising.

* Write instructions and specifications concerning proper use of machinery.

* Write instructions for assembly of prefabricated parts into units.

Behavioral Objectives:

4.01 Unit Objective: Given an array of instructional situations with problems, one of which is a problem which needs as a solution the design of instructional materials for a course, the learner will identify that design problem and determine the purposes, outcomes, standards, and procedures of the solution to the problem.

4.01.01 Given an array of instructional situations, one of which requires the design of instructional materials for a course, the learner will correctly identify that situation.

(A): The learner will select or devise criteria for instructional problems requiring the design of instructional materials as a solution.

(B): The learner will select the problem which requires the design of instructional materials as a solution.

(C): The learner will compass the selected problem with problem criteria established in (A).

4.01.02 Given a situation involving the need for designing instructional materials for a course the learner will write a definition of the problem which meets criteria for design problem definition.

(A): The learner will select or devise criteria for design problem definitions.

(B): The learner will write a design problem definition.

(C): The learner will compare his definition with definition criteria established in (A).

Representative tasks performed to accomplish objective 4.01.02:

1. Discuss with instructors to define training problem.
2. Describes critical incidents to define training problem.
3. Writes technical draft to define training problem.

4.01.03 Given the above design problem definition and criteria for problem solution standards and parameters, the learner will select and/or devise standards and parameters which meet those criteria.

(A): The learner will select or devise criteria for problem solution standards and parameters.

(B): The learner will select and/or devise problem solution standards and parameters.

(C): The learner will compare his problem solution standards and parameters with the criteria established in (A).

Representative tasks:

1. Evaluates extent materials to identify suitable content.

4.01.04 Given the standards and/or parameters for the design problem solution the learner will specify solutions or a solution which meets those standards and parameters.

(A): The learner will select or devise criteria for problem solution(s).

(B): The learner will select and/or devise solutions or a solution which involves designing materials for a course.

(C): The learner will compare solution(s) selected with criteria established in (A).

Representative tasks:

1. Defines entry behavior of students to determine content.

2. Discusses with instructors to identify teaching strategy.

4.01.05 Given a tenative solution which is designing instructional materials for a course,the learner will select and/or devise procedures for carrying out the solution which do indeed implement the solution.

(A): The learner will select or devise criteria for procedures which will implement the solution(s).

(B): The learner will select and/or devise procedures which implement the solution.

(C): The learner will compare the procedures selected to find out whether or not they meet criteria.

Representative tasks:

1. Writes technical draft to define solution.

2. Discusses with instructors to implement designed materials.

4.01.06 Given the procedures, the learner will follow those procedures to design instructional materials for the course which solve the instructional problem.

(A): The learner will select or devise criteria for evaluating whether or not the procedures for implementation have been followed.

(B): The learner will follow procedures and design materials for a course.

(C): The learner will compare the procedures followed to design course materials with criteria devised in (A).

Representative tasks:

1. Specifies tasks to identify terminal behavior.
2. Defines objectives to identify terminal behavior.
3. Writes overall design to organize content.
4. Prescribes content area to organize content.
5. Rewrites technical draft to improve training program.
6. Selects appropriate materials and media to organize course.
7. Researches literature to locate examples of simulation.
8. Designs role plays to meet training needs.

Given an implemented solution to the problem, the learner will evaluate that solution. (compare that solution with the standards and parameters set up in objective 4.01.04)

(A): The learner will select or devise criteria for an acceptable evaluation.

(B): The learner will carry out the evaluation specified.

(C): The learner will compare evaluation with criteria established in (A).

Representative tasks:

1. Teaches course to evaluate effectiveness of materials.
2. Designs pre and post tests to evaluate effectiveness of materials.
3. Administers pre and post tests to evaluate effectiveness of materials.

Learning Goal 4.02; to design programmed instruction materials:

Required responsibility level: Output (product or service), is specified in the assignment, which may be in the form of a memorandum or of a schematic (sketch or blueprint). The worker must work out his own ways of getting the job done, including selection of tools and equipment, sequence of operations (tasks), and obtaining important information (handbooks, etc.). He may either carry out work himself or set up standards and procedures for others.

In addition the worker is expected to know and employ theory so that he understands the whys and wherefores of the various options that are available for dealing with a problem and can independently select from among them. He may have to do some reading in the professional and/or trade literature in order to gain this understanding.

Required people skills: TAKING INSTRUCTIONS-HELPING: The learner is able to attend to the work assignment, instructions, or orders of supervisors. No immediate response or verbal exchange is required unless clarification of instruction is needed.

EXCHANGING INFORMATION: The learner is able to talk to, converse with, and/or signal people to convey or obtain information, or to clarify and work out details of an assignment, within the framework of well-established procedures.

CONSULTING: The learner is able to serve as a source of technical information and give such information or provides ideas to define, clarify, enlarge upon, or sharpen procedures, capabilities, or product specifications.

INSTRUCTING: The learner is able to teach subject matter to others, or train others, including animals, through explanation, demonstration, practice, and test.

TREATING: The learner is able to act on or interact with individuals or small groups of people or animals who need help (as in sickness) to carry out specialized therapeutic or adjustment procedures. Systematically observes results of treatment within the framework of total personal behavior because unique individual reactions to prescriptions (chemical, physician's, behavioral) may not fall within the range of prediction. Motivate, support, and instruct individuals to accept or cooperate with therapeutic adjustment procedures, when necessary.

Required General Education Development:

1. The learner must:
   * Have knowledge of a field of study (engineering, literature, history, business administration) having immediate applicability to the affairs of the world.
   * Define problems, collect data, establish facts, and draw valid conclusions.
   * Interpret an extensive variety of technical material in books, manuals, texts, etc.
   * Deal with some abstract but mostly concrete variables.

2. The learner must be able to count to simple addition and subtraction; read, copy, and/or record figures.

3. The learner must:
   * Have language ability to take and transcribe dictation, make appointments, and sort, route, and file the mail according to subject.
   * Write routine business correspondence reflecting standard procedures.
   * Interview job applicants to determine work best suited for their abilities and experience; contact employers to interest them in services of agency.

* Understand technical manuals and verbal instructions, as well as drawings and specifications, associated with practicing a craft.
* Guide people on tours through historical or public buildings, tell relevant anecdotes, etc.
*Conduct opinion research surveys involving stratified samples of the population.

The learner must:
* Report, write, or edit articles for magazines which, while popular, are of a highly literature nature (e.g. The New Yorker, Saturday Review. Scientific American).
*Prepare and deliver lectures for audiences that seek information about the arts, sciences, and humanities in an informal way.
*Report news for the newspapers, radio, or TV.
*Write copy for advertising.

Behavioral Objectives:

4.02 Unit objective: Given an array of instructional situations with problems, one of which is a problem requiring as a solution the design of programmed instruction materials as a solution, the learner will identify that design problem and determine the purposes, outcomes, standards and procedures for implementation of the problem solution.

4.02.01 Given an array of instructional situations, one of which requires the design of programmed instruction materials, the learner will correctly identify that situation.

(A): The learner will select or devise criteria for instructional problems requiring the design of programmed instruction materials as a solution.

(B): The learner will select that problem requiring, as a solution, the design of programmed instructional materials.

(C): The learner will compare the selected problem with the criteria established in (A).

Representative tasks:

1. Discusses with client to define problem area.

2. Questions client to delimit problem area.

3. Read client's current materials to research problem area.

4.02.02 Given a situation involving the need for designing programmed instruction materials for a course the learner will write a definition of the problem which meets criteria for design problem definitions.

(A): The learner will select or devise criteria for design problem definitions.

(B): The learner will write the design problem definition.

(C): The learner will compare his definition with criteria established in (A).

Representative tasks:

1. Discusses with client to define problem area.
2. Discusses with client to define target population.
3. Discusses with client to define general objectives.

4.02.03 Given the above definition and criteria for problem solution standards and parameters, the learner will select and/or devise standards and parameters which meet those criteria.

(A): The learner will select or devise criteria for problem solution(s).

(B): The learner will select or devise problem solution standards and parameters.

(C): The learner will compare those problem solution standards and parameters with criteria established in (A).

Representative tasks:

1. Analyzes potential audience to state assumptions about learners.
2. Discusses with client to identify essential objectives.
3. Listens in meetings to understand political aspects.

4.02.04 Given the standards and/or parameters for the design problem solution(s), the learner will specify the solution(s) which meet those standards and parameters.

(A): The learner will select or devise criteria for problem solution(s).

(B): The learner will select and/or devise solution(s) which involves designing programmed instruction materials.

(C): The learner will compare solution(s) selected with criteria established in (A).

Representative tasks:

1. Analyzes potential audience to make assumptions about learners.
2. Discusses with client to reconcile differences in data.
3. Analyzes content to select model or paradigm.

4.02.05 Given a tentative solution which is designing programmed instruction materials, the learner will select and/or devise procedures which do implement the solution.

(A): The learner will select or devise criteria for procedures which do implement the solution.

(B): The learner will select and/or devise implementation procedures.

(C): The learner will compare procedures with criteria developed in (A).

Representative tasks:

1. Listens in meeting to understand political implications.
2. Discusses with client to determine strategies.
3. Analyzes potential audience to make assumptions about learners.

4.02.06 Given the above procedures, the learner will follow those procedures to design programmed instruction materials which solve the problem.

(A): The learner will select or devise criteria for evaluating whether or not the procedures for implementation have been followed.

(B): The learner will follow the procedures and design programmed instruction materials.

(C): The learner will compare the procedures followed to design programmed instruction materials with criteria devised in (A).

Representative tasks:

1. Discusses with client to define general objectives.
2. Analyzes subject matter to state broad objectives.
3. Performs task analysis to organize content.
4. Restates task analysis to design flow chart.
5. Analyzes flow chart to write behavioral objectives.
6. Discusses with client to refine behavioral objectives.
7. Analyzes subject matter to determine segments for programming.
8. Discusses with content experts to understand content.
9. Discusses with client to revise behavioral objectives.

10. Analyzes objectives/flow chart to write content outline.

11. Writes brief draft of program to organize content.

12. Analyzes content outline to select appropriate materials.

13. Reviews content to sequence presentation.

14. Analyzes content to determine units and frames.

15. Translates objectives/content to write program frames.

16. Revises draft of program to reduce step size.

17. Locates technical information to design visual chart.

18. Analyzes technical information to design visual chart.

4.02.07 Given an implemented problem solution, the learner will evaluate that solution. (Compare that solution with the standards and parameters set up in objective 4.02.04).

(A): The learner will select or devise criteria for an acceptable evaluation.

(B): The learner will carry out the evaluation specified.

(C): The learner will compare the evaluation with the criteria established in (A).

Representative tasks:

1. Organizes pilot test to try out program.

2. Evaluates pilot performance to evaluate program effectiveness.

3. Revises program to improve quality (this is a recycle task; recycle to 4.02.05.)

Learning Goal 4.03; to design material for instructor training course:

Required responsibility level: Output (product or service), is specified in the assignment, which may be in the form of a memorandum or of a schematic (sketch or blueprint). The worker must work out his own ways of getting the job done, including selection of tools and equipment, sequence of operations (tasks), and obtaining important information (handbooks, etc.). He may either carry out work himself or set up standards and procedures for others.

In addition the worker is expected to know and employ theory so that he understands the whys and wherefores of the various options that are available for dealing with a problem and can independently select from among them. He may have to do some reading in the professional and/or trade literature in order to gain this understanding.

Required people skills: TAKING INSTRUCTIONS-HELPING: The learner is able to attend to the work assignment, instructions, or orders of supervisors. No immediate response or verbal exchange is required unless clarification of instruction is needed.

CONSULTING: The learner is able to serve as a source of technical information and give such information or provides ideas to define, clarify, enlarge upon, or sharpen procedures, capabilities, or product specifications.

INSTRUCTING: The learner is able to teach subject matter to others, or train others, including animals, through explanation, demonstration, practice, and test.

TREATING: The learner is able to act on or interact with individuals or small groups of people or animals who need help (as in sickness) to carry out specialized therapeutic or adjustment procedures. Systematically observes results of treatment within the framework of total personal behavior because unique individual reactions to prescriptions (chemical, physician's, behavioral) may not fall within the range of prediction. Motivate, support, and instruct individuals to accept or cooperate with therapeutic adjustment procedures, when necessary.

Required General Educational Development:

1. The learner must:

* Have knowledge of a field of study (engineering, literature, history, business administration) having immediate applicability to the affairs of the world.

* Define problems, collect data, establish facts, and draw valid conclusions.

* Interpret an extensive variety of technical material in books, manuals, texts, etc.

* Deal with some abstract but mostly concrete variables.

2. The learner must be able to count to simple addition and subtraction; read, copy, and/or record figures.

3. The learner must:

* Report, write, or edit articles for magazines which, while popular, are of a highly literate nature (e.g., The New Yorker, Saturday Review, Scientific American).

* Prepare and deliver lectures for audiences that seek information about the arts, sciences, and humanities in an informal way.

* Report news for the newspapers, radio, or TV.

* Write copy for advertising.

* Write instructions and specifications concerning proper use of machinery.

* Write instructions for assembly of

prefabricated parts into units.

Behavioral Objectives:

4.03 Unit objective: Given an array of instructional situations with problems, one of which is a problem requiring as a solution the design of materials for an instructor training course as a solution, the learner will identify that design problem and determine the purposes, outcomes, standards and procedures for implementation of the problem solution.

4.03.01 Given an array of instructional situations, one of which requires the design of materials for an instructor training course, the learner will correctly identify that situation.

(A): The learner will select or devise criteria for instructional problems requiring the design of materials for an instructor training course as a solution.

(B): The learner will select that problem requiring, as a solution, the design of materials for an instructor training course.

(C): The learner will compare the selected problem with the criteria estalblished in (A).

Representative tasks:

1. Discusses with client to define problem area.
2. Questions client to delimit problem area.
3. Reads client's current materials to research problem area.

4.03.02 Given a situation involving the need for designing materials for our instructor training course the learner will write a definition of the problem which meets criteria for design problem definitions.

(A): The learner will select or devise criteria for design problem definitions.

(B): The learner will write the design problem definition.

(C): The learner will compare his definition with criteria established in (A).

Representative tasks:

1. Discusses with client to define target population.
2. Discusses with client to define general objectives.

4.03.03 Given the above definition and criteria for problem solution standards and parameters, the learner will select and/or devise standards and parameters which meet those criteria.

(A): The learner will select or devise criteria for problem solution(s).

(B): The learner will select or devise problem solution standards and parameters.

(C): The learner will compare those problem solution standards and parameters with criteria established in (A).

Representative tasks:

1. Analyzes potential audience to state assumptions about learners.
2. Discusses with client to identify essential objectives.
3. Listens in meetings to understand political aspects.
4. Performs instructor task analysis to establish parameters of course.

4.03.04 Given the standards and/or parameters for the design problem solution(s), the learner will specify the solution(s) which meet those standards and parameters.

(A): The learner will select as devise criteria for problem solution(s).

(B): The learner will select and/or devise solution(s) which involves designing materials for an instructor training course.

(C): The learner will compare solution(s) selected with criteria established in (A).

Representative tasks:

1. Analyzes potential audience to make assumptions about learners.
2. Discusses with client to reconcile differences in data.
3. Analyzes content to select model or paradigm.

4.03.05 Given a tentative solution which is designing materials for instructor training course, the learner will select and/or devise procedures for implementing that solution.

(A): The learner will select or devise criteria for procedures which do implement the solution.

(B): The learner will select and/or devise implementation procedures.

(C): The learner will compare selected procedures with criteria developed in (A).

Representative tasks:

1. Listens in meeting to understand political implications.

2. Discusses with client to determine strategies.

3. Analyzes potential audience to make assumptions about learners.

4.03.06 Given the above procedures, the learner will follow those procedures to design materials for an instructor training course which solve the problem.

(A): The learner will select or devise criteria for evaluating whether or not the procedures for implementation have been followed.

(B): The learner will follow the procedures and design programmed instruction materials.

(C): The learner will compare the procedures followed to design materials for an instructor training course with criteria devised in (A).

Representative tasks:

1. Analyzes task list to group in logical clusters.

2. Analyzes task groups to expand into objectives.

3. Writes behavioral objectives to organize unit content.

4. Analyzes behavioral objectives to select method of instruction.

5. Designs content of unit to fulfill components of objectives.

6. Writes instructor activities to clarify and expand course content.

7. Decides on use of visuals to illustrate content.

8. Writes summary of lesson to clarify lesson content.

4.03.07 Given an implemented problem solution, (materials for instructor training course) the learner will evaluate that solution. (Compare that solution with the standards and parameters set up on objective 4.02.04) .

(A): The learner will select or devise criteria for an acceptable evaluation.

(B): The learner will carry out the evaluation specified.

(C): The learner will compare the evaluation with the criteria established in (A).

Representative tasks:

1. Teaches pilot lesson to time length.

2. Writes supplementary handbook to assist in teaching course.

3. Designs evaluation sheets to assess student reaction.

4. Revises instructional materials to improve quality (recycle back to relevant objective).

5. Gives instructions to have materials distributed.

Learning Goal 4.04; to coordinate designing instruction training course:

Required responsibility level: Various possible outputs are described that can meet stated technical or administrative needs. The worker must investigate the various possible outputs and evaluate them in regard to performance characteristics and input demands. This usually requires his creative use of theory well beyond referring to standard sources. There is no specification of inputs, methods, sequences, sources, or the like.

ANALYZING: The learner is able to examine and evaluate data (about things, data, or people) with reference to the criteria standards, and/or requirements of a particular discipline, art, technique, or craft to determine interaction effects (consequences) and to consider alternatives.

COORDINATING: The learner is able to decide time, place, and sequence of operations of a process, system, or organization, and/or the need for revision of goals, policies (boundary conditions), or procedures, on the basis of analysis of data and of performance review of pertinent objectives and requirements. Includes executing decisions and/or reporting on events.

TAKING INSTRUCTIONS-HELPING: The learner is able to attend to the work assignment, instructions, or orders of supervisors. No immediate response or verbal exchange is required unless clarification of instruction is needed.

CONSULTING: The learner is able to serve as a source of technical information and give such information or provides ideas to define, clarify, enlarge upon, or sharpen procedures, capabilities, or product specifications.

INSTRUCTING: The learner is able to teach subject matter to others, or train others, including animals, through explanation, demonstration, practice, and test.

TREATING: The learner is able to act on or interact with individuals or small groups of people or animals who need help (as in sickness) to carry out specialized therapeutic or adjustment procedures. Systematically observes results of treatment within the framework of total personal behavior because unique individual reactions to prescriptions (chemical, physician's, behavioral) may not fall within the range of prediction. Motivate, support, and instruct individuals to accept or cooperate with therapeutic adjustment procedures, when necessary.

Required General Educational Development:

1. The learner must:

* Have knowledge of a field of study (engineering, literature, history, business administration) having immediate applicability to the affairs of the world.

* Define problems, collect data, establish facts, and draw valid conclusions.

* Interpret an extensive variety of technical material in books, manuals, texts, etc.

* Deal with some abstract but mostly concrete variables.

2. The learner must be able to:

Count to simple addition and subtraction; read, copy, and/or record figures.

3. The learner must:

* Have language ability to take and transcribe dictation, make appointments, and sort, route, and file the mail according to subject.

* Write routine business correspondence reflecting standard procedures.

* Interview job applicants to determine work best suited for their abilities and experience; contact employers to interest them in services of agency.

* Understand technical manuals and verbal instructions, as well as drawings and specifications, associated with practicing a craft.

* Guide people on tours through historical or public buildings, tell relevant anecdotes, etc.

* Conduct opinion research surveys involving stratified samples of the population.

The learner must:

* Report, write, or edit articles for magazines which, while popular, are of a highly literate nature (e.g., The New Yorker, Saturday Review, Scientific American).

* Prepare and deliver lectures for audiences that seek information about the arts, sciences, and humanities in an informal way.

* Report news for the newspapers, radio, or TV.

* Write copy for advertising.

* Write instructions and specifications concerning proper use of machinery.

* Write instructions for assembly of prefabricated parts into units.

Behavioral Objectives:

4.04 Unit objective: Given an array of instructional situations with problems, one of which is a problem requiring as a solution the coordination of the design of an instructor training course as a solution, the learner will identify that design problem and determine the purposes, outcomes, standards and procedures for implementation of the problem solution.

4.04.01 Given an array of instructional situations, one of which requires the coordination of the design of an instructor training course materials, the learner will correctly identify that situation.

(A): The learner will select or devise criteria for instructional problems requiring the coordination of the design of an instructor training course as a solution.

(B): The learner will select that problem requiring, as a solution, the coordination of the design of an instructor training course.

(C): The learner will compare the selected problem with the criteria established in (A).

Representative tasks:

1. Discusses with director to outline course design.
2. Questions client to delimit outline course design.
3. Reads client's current materials to research course design.

4.04.02 Given a situation involving the need for coordinating the design of an instructor training course, the learner will write a definition of the problem which meets criteria for design problem definitions.

(A): The learner will select or devise criteria for design problem definitions.

(B): The learner will write the design problem definition.

(C): The learner will compare his definition with criteria established in (A).

Representative tasks:

1. Discusses with client to define problem area.
2. Discusses with client to define target population.
3. Discusses with client to define general objectives.

4.04.03 Given the above definition and criteria for problem solution standards and parameters, the learner will select and/or devise standards and parameters which meet those criteria.

(A): The learner will select or devise criteria for problem solution(s).

(B): The learner will select or devise problem solution standards and parameters.

(C): The learner will compare those problem solution standards and parameters with criteria established in (A).

Representative tasks:

1. Discusses with client to identify essential objectives.

2. Listens in meetings to understand political aspects.

4.04.04 Given the standards and/or parameters for the design problem solution(s),the learner will specify the solution(s) which meet those standards and parameters.

(A): The learner will select as devise criteria for problem solution(s).

(B): The learner will select and/or devise solution(s) which involves coordination of the design of an instructor training course.

(C): The learner will compare solution(s) selected with criteria established in (A).

Representative Tasks:

1. Analyzes potential audience to make assumptions about learners.

2. Discusses with director to organize course development.

3. Analyzes content to select model or paradigm.

4.04.05 Given a tentative solution which is coordinating the design of an instructor training course, the learner will select and/or devise procedures for implementing that solution.

(A): The learner will select or devise criteria for procedures which do implement the solution.

(B): The learner will select and/or devise implementation procedures.

(C): The learner will compare procedures with criteria developed in (A).

RepresentativeTasks:

1. Listens in meeting to understand political implications.

2. Discusses with client to determine strategies.

3. Analyzes potential audience to make assumptions about learners.

4. Conducts task analysis to specify procedures of coordinating the design of an instructor training course.

4.04.06 Given the above procedures, the learner will follow those procedures to coordinate the design of an instructor training course solves the problem.

(A): The learner will select or devise criteria for evaluating whether or not the procedures for implementation have been followed.

(B): The learner will follow the procedures and coordinate the design of an instructor training course.

(C): The learner will compare the procedures followed to coordinate the design of an instructor training course with criteria devised in (A).

Representative Tasks:

1. Discusses with directors to outline course design.
2. Identifies planning task force to develop task list.
3. Plans conferences to develop task list.
4. Discusses with course writers to develop behavioral objectives.
5. Writes operations plan to organize course development.
6. Estimates time factor to organize course development.
7. Selects site for pilot test.
8. Discusses with training officer to arrange for pilot test.
9. Discusses with publishers to organize mass production.
10. Estimates number of copies needed to inform publishers.
11. Writes memos to field personnel to inform of progress of course.
12. Conducts briefing to inform of progress of course.
13. Writes report to management to inform of progress of course.

4.04.07 Given an implemented problem solution, the learner will evaluate that solution. (compare that solution with the standards and parameters set up in objective 4.02.04).

(A): The learner will select or devise criteria for an acceptable evaluation.

(B): The learner will carry out the evaluation specified.

(C): The learner will compare the evaluation with the criteria established in (A).

Representative Tasks:

1. Selects site for pilot test.
2. Discusses with training offices to arrange for pilot test.
3. Critiques draft of course materials to improve quality.
4. Designs evaluation forms to evaluate effectiveness of course.

Learning Goal 4.05; to write unit for instructor course:

Required responsibility level: Output (product or service), is specified in the assignment, which may be in the form of a memorandum or of a schematic (sketch or blueprint). The worker must work out his own ways of getting the job done, including selection of tools and equipment, sequence of operations (tasks), and obtaining important information (handbooks, etc.). He may either carry out work himself or set up standards and procedures for others.

In addition the worker is expected to know and employ theory so that he understands the whys and wherefores of the various options that are available for dealing with a problem and can independently select from among them. He may have to do some reading in the professional and/or trade literature in order to gain this understanding.

Required data skills: ANALYZING: The learner is able to examine and evaluate data (about things, data, or people) with reference to the criteria standards, and/or requirements of a particular discipline, art, technique, or craft to determine interaction effects (consequences) and to consider alternatives.

TAKING INSTRUCTIONS-HELPING: The learner is able to attend to the work assignment, instructions, or orders of supervisors. No immediate response or verbal exchange is required unless clarification of instruction is needed.

Required General Educational Development:

1. The learner must:

* Have knowledge of a system or interrelated procedures, such as bookkeeping, internal combustion engines, electric wiring systems, nursing, farm management, ship sailing, or machining.

* Apply principles to solve practical, everyday problems and deal with a variety of concrete variables in situations where only limited standardization exists.

* Interpret a variety of instructions furnished in written, oral, diagrammatic, or schedule form.

The learner must:

* Have knowledge of a field of study (engineering, literature, history, business administration) having immediate applicability to the affairs of the world.

* Define problems, collect data, establish facts, and draw valid conclusions.

* Interpret an extensive variety of technical material in books, manuals, texts, etc.

* Deal with some abstract but mostly concrete variables.

2. The learner must be able to count to simple addition and subtraction; read, copy, and/or record figures.

3. The learner must:

* Have language ability to take and transcribe dictation, make appointments, and sort, route, and file the mail according to subject.

* Write routine business correspondence reflecting standard procedures.

* Interview job applicants to determine work best suited for their abilities and experience; contact employers to interest them in services of agency.

* Understand technical manuals and verbal instructions, as well as drawings and specifications, associated with practicing a craft.

* Guide people on tours through historical or public buildings, tell relevant anecdotes, etc.

* Conduct opinion research surveys involving stratified samples of the population.

The learner must:

* Report, write, or edit articles for magazines which, while popular, are of a highly literate nature (e.g., The New Yorker, Saturday Review, Scientific American).

* Prepare and deliver lectures for audiences that seek information about the arts, sciences, and humanities in an informal way.

* Report news for the newspapers, radio, or TV.

* Write copy for advertising.

* Write instructions and specifications concerning proper use of machinery.

* Write instructions for assembly of prefabricated parts into units.

Behavioral Objectives:

4.05 Unit objective: Given an array of instructional situations with problems, one of which is a problem requiring as a solution the writing of a unit for instructor course as a solution, the learner will identify that design problem and determine the purposes, outcomes, standards and procedures for implementation of the problem solution.

4.05.01 Given an array of instructional situations, one of which requires the writing of a unit for instructor course the learner will correctly identify that situation.

(A): The learner will select or devise criteria for instructional problems requiring the waiting of a unit for instructor course as a solution.

(B): The learner will select that problem requiring, as a solution, the writing of a visit for instructor course.

(C): The learner will compare the selected problem with the criteria established in (A).

Representative Tasks:

(None listed in study.)

4.05.02 Given a situation involving the need for writing a unit for instructor course, the learner will write a definition of the problem which meets criteria for design problem definitions.

(A): The learner will select or devise criteria for design problem definitions.

(B): The learner will write the design problem definition.

(C): The learner will compare his definition with criteria established in (A).

Representative Tasks:

(None listed in study.)

4.05.03 Given the above definition and criteria for problem solution standards and parameters, the learner will select and/or devise standards and parameters which meet those criteria.

(A): The learner will select or devise criteria for problem solution(s).

(B): The learner will select or devise problem solution standards and parameters.

(C): The learner will compare those problem solution standards and parameters with criteria established in (A).

Representative Tasks:

1. Discusses with client to identify essential objectives.

2. Assesses content to determine length of time.

4.05.04 Given the standards and/or parameters for the design problem solution(s), the learner will specify the solution(s) which meet those standards and parameters.

(A): The learner will select or devise criteria for problem solution(s).

(B): The learner will select and/or devise solution(s) which involves writing a unit for instructor training course.

(C): The learner will compare solution(s) selected with criteria established in (A).

Representative Tasks:

1. Analyzes potential audience to make assumptions about learners.

2. Discusses with client to reconcile differences in data.

3. Analyzes content to select model or paradigm.

4. Analyzes content to select proper media.

4.05.05 Given a tentative solution which is writing a unit for instructor training course, the learner will select and/or devise procedures for implementing that solution.

(A): The learner will select or devise criteria for procedures which do implement the solution.

(B): The learner will select and/or devise implementation procedures.

(C): The learner will compare procedures with criteria developed in (A).

Representative Tasks:

1. Listens in meeting to understand political implications.

2. Discusses with client to determine strategies.

3. Analyzes potential audience to make assumptions about learners.

4.05.06 Given the above procedures, the learner will follow those procedures to write a unit for an instructors training course which solve the problem.

(A): The learner will select or devise criteria for evaluating whether or not the procedures for implementation have been followed.

(B): The learner will follow the procedures and write a unit for instructor course.

(C): The learner will compare the procedures followed to write course unit with criteria devised in (A).

Representative Tasks:

1. Analyzes learning modes to list characteristics.

2. Assigns modes to objectives to provide model for instruction.

3. Analyzes lesson plan construction to list characteristics.

4. Designs/sample lesson plans to provide model for instruction.

5. Analyzes test construction to list characteristics.

6. Designs sample tests to provide models for instruction.

4.05.07 Given an implemented problem solution, (unit for instructor course) the learner will evaluate that solution. (compare that solution with the standards and parameters set up in objective 4.02.04).

(A): The learner will select or devise criteria for an acceptable evaluation.

(B): The learner will carry out the evaluation specified.

(C): The learner will compare the evaluation with the criteria established in (A).

Representative Tasks:

(None listed in study.)

Learning Goal 4.06; to write instructor's guide for instructional materials:

Required responsibility level: Output (product or service), is specified in the assignment, which may be in the form of a memorandum or of a schematic (sketch or blueprint). The worker must work out his own ways of getting the job done, including selection of tools and equipment, sequence of operations (tasks), and obtaining important information (handbooks, etc.). He may either carry out work himself or set up standards and procedures for others.

In addition the worker is expected to know and employ theory so that he understands the whys and wherefores of the various options that are available for dealing with a problem and can independently select from among them. He may have to do some reading in the professional and/or trade literature in order to gain this understanding.

Required data skills: ANALYZING: The learner is able to examine and evaluate data (about things, data, or people) with reference to the criteria standards, and/or requirements of a particular discipline, art, technique, or craft to determine interaction effects (consequences) and to consider alternatives.

Required people skills: TAKING INSTRUCTIONS-HELPING: The learner is able to attend to the work assignment, instructions, or orders of supervisors. No immediate response or verbal exchange is required unless clarification of instruction is needed.

Required General Educational Development:

1. The learner must:
* Have knowledge of a field of study

(engineering, literature, history, business administration) having immediate applicability to the affairs of the world.

* Define problems, collect data, establish facts, and draw valid conclusions.

* Interpret an extensive variety of technical material in books, manuals, texts, etc.

* Deal with some abstract but mostly concrete variables.

2. The learner must be able to count to simple addition and subtraction; read, copy, and/or record figures.

3. The learner must:

* Have language ability to take and transcribe dictation, make appointments, and sort, route, and file the mail according to subject.

* Write routine business correspondence reflecting standard procedures.

* Interview job applicants to determine work best suited for their abilities and experience; contact employers to interest them in services of agency.

* Understand technical manuals and verbal instructions, as well as drawings and specifications, associated with practicing a craft.

* Guide people on tours through historical or public buildings, tell relevant anecdotes, etc.

* Conduct opinion research surveys involving stratified samples of the population.

The learner must:

* Report, write, or edit articles for magazines which, while popular, are of a highly literate nature (e.g., The New Yorker, Saturday Review, Scientific American).

* Prepare and deliver lectures for audiences that seek information about the arts, sciences, and humanities in an informal way.

*Report news for the newspapers, radio, or TV.

* Write copy for advertising.

* Write instructions and specifications concerning proper use of machinery.

* Write instructions for assembly of prefabricated parts into units.

Behavioral Objectives:

4.06 Unit objective: Given an array of instructional situations with problems, one of which is a problem requiring as a solution to write instructor's guide to instructional materials as a solution, the learner will identify that design problem and determine the purposes, outcomes, standards and procedures for implementation of the problem solution.

4.06.01 Given an array of instructional situations, one of which requires the learner to write an instructor's guide to instructional materials, the learner will correctly identify that situation.

(A): The learner will select or devise criteria for instructional problems requiring the design of programmed instruction materials as a solution.

(B): The learner will select that problem requiring, as a solution, the learner to write an instructor's guide to instructional materials.

(C): The learner will compare the selected problem with the criteria established in (A).

Representative Tasks:

1. Questions client to delimit problem area.

4.06.02 Given a situation involving the need for the learner to write an instructor's guide to instructional materials the learner will write a definition of the problem which meets criteria for design problem definitions.

(A): The learner will select or devise criteria for design problem definitions.

(B): The learner will write the design problem definition.

(C): The learner will compare his definition with criteria established in (A).

Representative Tasks:

(None listed in study.)

4.06.03 Given the above definition and criteria for problem solution standards and parameters, the learner will select and/or devise standards and parameters which meet those criteria.

(A): The learner will select or devise criteria for problem solution(s).

(B): The learner will select or devise problem solution standards and parameters.

(C): The learner will compare those problem solution standards and parameters with criteria established in (A).

Representative Tasks:

(None listed in study.)

4.06.04 Given the standards and/or parameters for the design problem solution(s), (the instructor's guide to instructional materials) the learner will specify the solution(s) which meet those standards and parameters.

(A): The learner will select or devise criteria for problem solution(s).

(B): The learner will select and/or devise solution(s) which involves writing an instructor's guide to instructional materials.

(C): The learner will compare solution(s) selected with criteria established in (A).

Representative Tasks:

1. Analyzes potential audience to make assumptions about learners.
2. Analyzes content to select model or paradigm.

4.06.05 Given a tentative solution which is writing an instructor's guide to instructional materials, the learner will select and/or devise procedures for implementing that solution.

(A): The learner will select or devise criteria for procedures which do implement the solution.

(B): The learner will select and/or devise implementation procedures.

(C): The learner will compare procedures with criteria developed in (A).

Representative Tasks:

1. Listens in meeting to understand political implications.
2. Discusses with client to determine strategies.
3. Analyzes potential audience to make assumptions about learner.

4.06.06 Given the above procedures, the learner will follow those procedures to write instructor's guide to instructional materials which solves the problem.

(A): The learner will select or devise criteria for evaluating whether or not the procedures for implementation have been followed.

(B): The learner will follow the procedures and design programmed instruction materials.

(C): The learner will compare the procedures followed to design programmed instruction materials with criteria devised in (A).

Representative Tasks:

1. Analyzes objectives to restate more fully.
2. Assess time spent in pilot to indicate time for items.
3. Analyzes content and time to write schedule.
4. Analyzes unprogrammed segments to write lesson plans.

5. Analyzes objectives to write pre-test objectives.

6. Analyzes objectives to write practice exercies.

7. Analyzes objectives to write role plays.

4.06.07 Given an implemented problem solution, (instructor's guide to instructional materials) the learner will evaluate that solution. (compare that solution with the standards and parameters set up in objective 4.02.04).

(A): The learner will select or devise criteria for an acceptable evaluation.

(B): The learner will carry out the evaluation specified.

(C): The learner will compare the evaluation with the criteria established in (A).

Representative Tasks:

1. Organizes pilot test to try out program.

2. Evaluates pilot performance to evaluate program effectiveness.

3. Revises program to improve quality. (This is a recycle task; recycle to 4.06.05.)

Learning Goal 4.07; to coordinate design of EDEX materials:

Required responsibility level: Various possible outputs are described that can meet stated technical or administrative needs. The worker must investigate the various possible outputs and evaluate them in regard to performance characteristics and input demands. This usually requires his creative use of theory well beyond referring to standard sources. There is no specification of inputs, methods, sequences, sources, or the like.

Required data skills: COMPUTING: The learner is able to perform arithmetic operations and make reports and/or carries out a prescribed action in relation to them.

COMPILING: The learner is able to gather, collate, or classify information about data, people, or things.

ANALYZING: The learner is able to examine and evaluate data (about things, data, or people) with reference to the criteria standards, and/or requirements of a particular discipline, art, technique, craft to determine interaction effects (consequences) and to consider alternatives.

COORDINATING: The learner is able to decide time, place, and sequence of operations of a process, system, or organization and/or the need for revision of goals, policies (boundary conditions), or procedures, on the basis of analysis of data and of performance review of pertinent objectives and requirements. Includes executing decisions and/or reporting on events.

Required people skills: TAKING INSTRUCTIONS-HELPING: The learner is able to attend to the work assignment, instructions, or orders of supervisiors. No immediate response or verbal exchange is required unless clarification of instruction is needed.

CONSULTING: The learner is able to serve as a source of technical information and give such information or provides ideas to define, clarify, enlarge upon, or sharpen procedures, capabilities, or product specifications.

INSTRUCTING: The learner is able to teach subject matter to others, or train others, including animals, through explanation, demonstration, practice, and test.

TREATING: The learner is able to act on or interact with individuals or small groups of people or animals who need help (as in sickness) to carry out specialized therapeutic or adjustment procedures. Systematically observes results of treatment within the framework of total personal behavior because unique individual reactions to prescriptions (chemical, physician's, behavioral) may not fall within the range of prediction. Motivate, support, and instruct individuals to accept or cooperate with therapeutic adjustment procedures, when necessary.

Required General Educational Development:

1. The learner must:

* Have knowledge of a field of study (engineering, literature, history, business administration) having immediate applicability to the affairs of the world.

* Define problems, collect data, establish facts, and draw valid conclusions.

* Interpret an extensive variety of technical material in books, manuals, texts, etc.

* Deal with some abstract but mostly concrete variables.

2. The learner must be able to make arithmetic calculations involving fractions, decimals, and percentages.

3. The learner must:

* Have language ability to take and transcribe dictation, make appointments, and sort, route, and file the mail according to subject.

* Write routine business correspondence reflecting standard procedures.

* Interview job applicants to determine work best suited for their abilities and experience; contact employers to interest them in services of agency.

* Understand technical manuals and verbal instructions, as well as drawings and specifications, associated with practicing a craft.

* Guide people on tours through historical or public buildings, tell relevant anecdotes, etc.

* Conduct opinion research surveys involving stratified samples of the population.

The learner must:

* Report, write, or edit articles for magazines with, while popular, are of a highly literate nature (e.g., The New Yorker, Saturday Review, Scientific American).

* Prepare and deliver lectures for audiences that seek information about the arts, sciences, and humanities in an informal way.

* Report news for the newspapers, radio, or TV.

* Write copy for advertising.

* Write instructions and specifications concerning proper use of machinery.

* Write instructions for assembly of prefabricated parts into units.

Behavioral Objectives:

4.07 Unit objective: Given an array of instructional situations with problems, one of which is a problem requiring as a solution the coordination of the designing EDEX materials as a solution, the learner will identify that design problem and determine the purposes, outcomes, standards and procedures for implementation of the problem solution.

4.07.01 Given an array of instructional situations, one of which requires the coordination of the design of EDEX materials, the learner will correctly identify that situation.

(A): The learner will select or devise criteria for instructional problems requiring the coordination of the design of EDEX materials as a solution.

(B): The learner will select that problem requiring, as a solution, the design of programmed materials instructional materials.

(C): The learner will compare the selected problem with the criteria established in (A).

Representative Tasks:

1. Discusses with client to define problem area.

2. Questions client to delimit problem area.

3. Reads client's current materials to research problem area.

4.07.02 Given a situation involving the need for coordinating the design of EDEX materials for a course the learner will write a definition of the problem which meets criteria for design problem definitions.

(A): The learner will select or devise criteria for design problem definitions.

(B): The learner will write the design problem definition.

(C): The learner will compare his definition with criteria established in (A).

Representative Tasks:

1. Discusses with client to define problem area.
2. Discusses with client to define target population.
3. Discusses with client to define general objectives.

4.07.03 Given the above definition and criteria for problem solution standards and parameters, the learner will select and/or devise standards and parameters which meet those criteria.

(A): The learner will select or devise criteria for problem solution(s).

(B): The learner will select or devise problem solution standards and parameters.

(C): The learner will compare those problem solution standards and parameters with criteria established in (A).

Representative Tasks:

(None listed in study.)

4.07.05 Given a tentative solution which is coordindating the designing of EDEX materials, the learner will select and/or devise procedures for implementing that solution.

(A): The learner will select or devise criteria for procedures which do implement the solution.

(B): The learner will select and/or devise implementation procedures.

(C): The learner will compare procedures with criteria developed in (A).

Representative Tasks:

1. Discusses with client to determine strategies.

4.07.06 Given the above procedures, the learner will follow those procedures to coordinate the design of EDEX materials which solve the problem.

(A): The learner will select or devise criteria for evaluating whether or not the procedures for implementation have been followed.

(B): The learner will follow the procedures and design programmed instruction materials.

(C): The learner will compare the procedures followed to design programmed instruction materials with criteria devised in (A).

Representative Tasks:

1. Identifies field personnel to select program developers.
2. Evaluates written program to suggest improvements.
3. Asks clarifying questions to suggest improvements.
4. Analyzes step size to evaluate written program.
5. Suggests revisions to improve written program.
6. Assigns color to frames to improve written program.
7. Discusses with producer to clarify production details.
8. Analyzes script to assign pauses and tape stops.
9. Examines draft visuals to assess correlation with script.
10. Analyzes program to assess logical development.

4.07.07 Given an implemented problem solution, the learner will evaluate that solution. (compare that solution with the standards and parameters set up in objective 4.02.04).

(A): The learner will select or devise criteria for an acceptable evaluation.

(B): The learner will carry out the evaluation specified.

(C): The learner will compare the evaluation with the criteria established in (A).

Representative Tasks:

1. Analizes step size to evaluate program.
2. Chooses subjects to test out prototype program.
3. Schedules testing session to test out prototype program.

4. Evaluates results from test to test out prototype program.

Learning Goal 4.08; develop instructional packages for individualized instruction (instructional packages):

Required responsibility level: Various possible outputs are described that can meet stated technical or administrative needs. The worker must investigate the various possible outputs and evaluate them in regard to performance characteristics and input demands. This usually requires his creative use of theory well beyond referring to standard sources. There is no specification of inputs, methods, sequences, sources, or the like.

Required data skills: ANALYZING: The learner is able to examine and evaluate data (about things, data, or people) with reference to the criteria standards, and/or requirements of a particular discipline, art, technique, or craft to determine interaction effects (consequences) and to consider alternatives.

COORDINATING: The learner is able to decide time, place, and sequence of operations of a process, system, or organization and/or the need for revision of goals, policies (boundary conditions), or procedures, on the basis of analysis of data and of performance review of pertinent objectives and requirements. Includes executing decisions and/or reporting on events.

Required people skills: EXCHANGING INFORMATION: The learner is able to talk to, converse with, and/or signal people to convey or obtain information, or to clarify and work out details of an assignment, within the framework of well-established procedures.

CONSULTING: The learner is able to serve as a source of technical information and give such information or provide ideas to define, clarify, enlarge upon, or sharpen procedures, capabilities, or product specifications.

INSTRUCTING: The learner is able to teach subject matter to others, or train others, including animals, through explanation, demonstration, practice, and test.

TREATING: The learner is able to act on or interact with individuals or small groups of people or animals who need help (as in sickness) to carry out specialized therapeutic or adjustment procedures. Systematically observes results of treatment within the framework of total personal behavior because unique individual reactions to prescriptions (chemical, physician's, behavioral) may not fall within the range of prediction. Motivate, support, and instruct individuals to accept or cooperate with therapeutic adjustment procedures, when necessary.

Required General Educational Development:

1. The learner must:
* Have knowledge of a field of study

(engineering, literature, history, business administration) having immediate applicability to the affairs of the world.

* Define problems, collect data, establish facts, and draw valid conclusions.

* Interpret an extensive variety of technical material in books, manuals, texts, etc.

* Deal with some abstract but mostly concrete variables.

2. The learner must be able to use arthemetic to add, subtract, multiply, and divide whole numbers.

3. The learner must:

* Have language ability to take and transcribe dictation, make appointments, and sort, route, and file the mail according to subject.

* Write routine business correspondence reflecting standard procedures.

* Interview job applicants to determine work best suited for their abilities and experience; contact employers to interest them in services of agency.

* Understand technical manuals and verbal instructions, as well as drawings and specifications, associated with practicing a craft.

* Guide people on tours through historical or public buildings, tell relevant anecdotes, etc.

* Conduct opinion research surveys involving stratified samples of the population.

The learner must:

* Report, write, or edit articles for magazines which, while popular, are of a highly literate nature (e.g., The New Yorker, Saturday Review, Scientific American).

* Prepare and deliver lectures for audiences that seek information about the arts, sciences, and humanities in an informal way.

* Report news for the newspapers, radio, or TV.

* Write copy for advertising.

* Write instructions and specifications concerning proper use of machinery.

* Write instructions for assembly of prefabricated parts into units.

Behavioral Objectives:

4.08 Unit objective: Given an array of instructional situations with problems, one of which is a problem requiring as a solution the development of Individualized Instruction instructional packages as a solution, the learner will identify that design problem and determine the purposes, outcomes, standards and procedures for implementation of the problem solution.

4.08.01 Given an array of instructional situations, one of which requires the development of Individualized Instruction instructional packages the learner will correctly identify that situation.

(A): The learner will select or devise criteria for instructional problems requiring the development of Individualized Instruction instructional packages as a solution.

(B): The learner will select that problem requiring, as a solution, the development of Individualized Instruction instructional packages.

(C): The learner will compare the selected problem with the criteria established in (A).

Representative Tasks:

(None listed in study.)

4.08.02 Given a situation involving the need for development of Individualized Instruction instructional packages the learner will write a definition of the problem which meets criteria for design problem definitions.

(A): The learner will select or devise criteria for design problem definitions.

(C): The learner will write the design problem definition.

(D): The learner will compare his definition with criteria established in (A).

Representative Tasks:

(None listed in study.)

4.08.03 Given the above definition and criteria for problem solution standards and parameters, the learner will select and/or devise standards and parameters which meet those criteria.

(A): The learner will select or devise criteria for problem solution(s).

(B): The learner will select or devise problem solution standards and parameters.

(C): The learner will compare those problem solution standards and parameters with criteria established in (A).

Representative Tasks:

1. Consults with client to determine client roles.
2. Consults with client to determine company roles.
3. Instructs clients in logistics to determine work/money/time.

4. Questions client to determine wants/needs and their relationships.

5. Analyzes instructional setting to define learning environment.

4.08.04 Given the standards and/or parameters for the design problem solution(s), (development of Individualized Instruction instructional packages) the learner will specify the solution(s) which meet those standards and parameters.

(A): The learner will select or devise criteria for problem solution(s).

(B): The learner will select and/or devise solution(s) which involves the development of Individualized Instruction instructional packages.

(C): The learner will compare solution(s) selected with criteria established in (A).

Representative Tasks:

1. Analyzes potential audience to make assumptions about learners.

2. Analyzes content to select model or paradigm.

4.08.05 Given a tentative solution which is developing Individualized Instruction instructional packages, the learner will select and/or devise procedures for implementing that solution.

(A): The learner will select or devise criteria for procedures which do implement the solution.

(B): The learner will select and/or devise implementation procedures.

(C): The learner will compare procedures with criteria developed in (A).

Representative Tasks:

1. Listens in meeting to understand political implications.

2. Discusses with client to determine strategies.

3. Analyzes potential audience to make assumptions about learners.

4.08.06 Given the above procedures, the learner will follow those procedures to develop Individualized Instruction instructional packages which solve the problem.

(A): The learner will select or devise criteria for evaluating whether or not the procedures for implementation have been followed.

(B): The learner will follow the procedures and develop Individualized Instruction instructional packages.

(C): The learner will compare the procedures followed to development of Individualized Instruction instructional packages with criteria devised in (A).

Representative Tasks:

1. Negotiates contract with customer to initiate project development.
2. Instructs customer in Individualized Instruction to define problems in process.
3. Instructs customer in Individualized Instruction to define changed concepts in instruction.
4. Instructs customer in Individualized Instruction to define effects on curriculum.
5. Instructs customer in Individualized Instruction to define new role of testing.
6. Consults with client to determine client roles.
7. Consults with client to determine client company roles.
8. Instructs client in logistics to define work/time/money relationships.
9. Questions client to define wants/needs and their relationships.
10. Consults with client to feedback goals for project.
11. Analyzes instructional setting to define learning environment.
12. Analyzes project goals to define criterion performance.
13. Translates criterion performance to define learning objectives.
14. Analyzes current content to decide if it teacher to objectives.
15. Analyzes current content to determine procedures leaner must learn.
16. Analyzes current content to define alternative procedures.
17. Synthesizes objectives/content to define needed new content.
18. Extrapolates from content/objectives to define teaching strategies.
19. Translates teaching strategies to make media selections.
20. Coordinates materials procurement to provide needed audio and visual characteristics.
21. Reads final script to edit content/sequence/ambiquity.

22. Writes introduction to materials to describe utilization.

23. Plays role of student to field test materials.

4.08.07 Given an implementated problem solution, (developed Individualized Instruction instructional packages) the learner will evaluate that solution (compare that solution with the standards and parameters set up in objective 4.02.04).

(A): The learner will select or devise criteria for an acceptable evaluation.

(B): The leaner will carry out the evaluation specified.

(C): The learner will compare the evaluation with the criteria established in (A).

Representative Tasks:

1. Plays role of student to test materials.
2. Speaks to client to set up review panel.
3. Shows materials to client to obtain review and comments.
4. Translates suggestions to make revisions (recycle to proper objective).
5. Sends materials to client to fulfill contract.

Learning Goal 4.09; to design multi-media presentation.

Required responsibility level: There is some question as to what the need or problem really is or what directions should be pursued in solving it. In order to define it, control and explore the behavior of the variables, and formulate possible outputs and their performance characteristics, the worker must consult largely unspecified sources of information, and devise investigations, surveys, or data analysis studies.

Required data skills: ANALYZING: The learner is able to examine and evaluate data (about things, data, or people) with reference to the criteria standards, and/or requirements of a particular discipline, art, technique, or craft to determine interaction effects (consequences) and to consider alternatives.

COORDINATING: The learner is able to decide time, place, and sequence of operations of a process, system, or organization and/or the need for revision of goals, policies (boundary conditions), or procedures, on the basis of analysis of data and of performance review of pertinent objectives and requirements. Includes executing decisions and/or reporting on events.

Required people skills: TAKING INSTRUCTIONS-HELPING: The learner is able to attend to the work assignment, instructions, or orders of supervisors. No immediate response or verbal exchange is required unless clarification of instruction is needed.

EXCHANGING INFORMATION: The learner is able to talk to, converse with, and/or signal people to convey or obtain information, or to clarify and work out details of an assignment, within the framework of well-established procedures.

COACHING: The learner is able to befriend and encourage individuals on a personal, caring basis by approximating a peer or family-type relationship either in a one-to-one or small group situation, and gives instructions, advice, and personal assistance concerning activities of daily living, the use of various institutional services, and participation in groups.

PERSUADING: The learner is able to influence others in favor of a product, service, or point of view by talks or demonstrations.

DIVERTING: The learner is able to amuse others.

Required General Educational Development:

1. The learner must:

* Have knowledge of a field of study (engineering, literature, history, business administration)having immediate applicability to the affairs of the world.

* Define problems, collect data, establish facts, and draw valid conclusions.

* Interpret an extensive variety of technical material in books, manuals, texts, etc.

* Deal with some abstract but mostly concrete variables.

2. The learner must be able to count to simple addition and subtraction; read, copy, and/or record figures.

3. The learner must:

* Have language ability to take and transcribe dictation, make appointments, and sort, route, and file the mail according to subject.

* Write routine business correspondence reflecting standard procedures.

* Interview job applicants to determine work best suited for their abilities and experience; contact employers to interest them in services of agency.

* Understand technical manuals and verbal instructions, as well as drawings and specifications, associated with practicing a craft.

* Guide people on tours through historical or public buildings, tell relevant anecdotes, etc.

* Conduct opinion research surveys involving stratified samples of the population.

The learner must:

* Report, write, or edit articles for magazines which, while popular, are of a highly literate nature (e.g., The New Yorker, Saturday Review, Scientific American).
* Prepare and deliver lectures for audiences that seek information about the arts, sciences, and humanities in an informal way.
* Report news for the newspapers, radio, or TV.
* Write copy for advertising.
* Write instructions and specifications concerning proper use of machinery.
* Write instructions for assembly of prefabricated parts into units.

Behavioral Objectives:

4.09 Unit objective: Given an array of instructional situations with problems, one of which is a problem requiring as a solution the design of a multi-media presentation as a solution, the learner will identify that design problem and determine the purposes, outcomes, standards and procedures for implementation of the problem solution.

4.09.01 Given an array of instructional situations, one of which requires the design of a multi-media presentation, the learner will correctly identify that situation.

(A): The learner will select or devise criteria for instructional problems requiring the design of a multi-media presentation as a solution.

(B): The learner will select that problem requiring, as a solution, the design of a multi-media presentation.

(C): The learner will compare the selected problem with the criteria established in (A).

Representative Tasks:

1. Formulates vague idea.
2. Looks at organization projects to find production opportunity.
3. Identifies projects related to idea to find production opportunity.
4. Identifies amenable project directors to find production opportunity.

4.09.02 Given a situation involving the need for designing a multi-media presentation the learner will write a definition of the problem which meets criteria for design problem definitions.

(A): The learner will select or devise criteria for design problem definitions.

(B): The learner will write the design problem definition.

(C): The learner will compare his definition with criteria established in (A).

Representative Tasks:

1. Speaks to project directors to persuade to produce presentation.
2. Discusses with project director to ascertain his audience and objective.
3. Calls associate to obtain design assistance.

4.09.03 Given the above definition and criteria for problem solution standards and parameters, the learner will select and/or devise standards and parameters which meet those criteria.

(A): The learner will select or devise criteria for problem solution(s).

(B): The learner will select or devise problem solution standards and parameters.

(C): The learner will compare those problem solution standards and parameters with criteria established in (A).

Representative Tasks:

1. Discusses with project director to ascertain his audience and objective.
2. Examines idea to clarify presentation subject.
3. Consider philosophy behind idea to clarify presentation subject.
4. Considers ways of presenting to clarify presentation subject.
5. Analyzes presentation subject to write general objectives.

4.09.04 Given the standards and/or parameters for the design problem solution(s), (a multi-media presentation) the learner will specify the solution(s) which meet those standards and parameters.

(A): The learner will select as devise criteria for problem solution(s).

(B): The learner will select and/or devise solution(s) which involves designing a multi-media presentation.

(C): The learner will compare solution(s) selected with criteria established in (A).

Representative Tasks:

1. Analyzes presentation subject to write general objectives.
2. Considers presentation modes to clarify presentation subject.
3. Calls associate to obtain design assistance.

4.09.05 Given a tentative solution which is designing a multi-media presentation, the learner will select and/or devise procedures for implementing that solution.

(A): The learner will select or devise criteria for procedures which do implement the solution.

(B): The learner will select and/or devise implementation procedures.

(C): The learner will compare procedures with criteria developed in (A).

Representative Tasks:

1. Discusses with project directors to ascertain audience and objectives.
2. Speaks with project director to persuade to produce presentation.
3. Considers modes of presentation to clarify presentation subject.
4. Consider media involved to clarify presentation format.
5. Analyzes presentation subject to write general objectives.

4.09.06 Given the above procedures, the learner will follow those procedures to design a multi-media presentation which solves the problem.

(A): The learner will select or devise criteria for evaluating whether or not the procedures for implementation have been followed.

(B): The learner will follow the procedures and design programmed instruction materials.

(C): The learner will compare the procedures followed to design a multi-media presentation with criteria devised in (A).

Representative Tasks:

1. Discusses with client to define general objectives.
2. Examines meaning of idea to clarify presentation subject.
3. Considers philosophy behind idea to clarify presentation subject.
4. Consider presentation modes to clarify presentation subject.

5. Considers media involved to clarify presentation subject.
6. Analyzes presentation subject to write general objectives.
7. Breaks down general objectives to define behavioral objectives.
8. Conceives ways of meeting objectives to develop treatment.
9. Translates objectives/treatment to determine sequence.
10. Translates objectives/treatment to determine content.
11. Translates objectives/treatment to determine media.
12. Synthesizes objectives/sequence/content/media to develop presentation outline.
13. Synthesizes objectives/sequence/content/media to determine needed visuals.
14. Syntehesizes objectives/sequence/content/media to determine needed audio.
15. Synthesizes objectives/sequence/content/media to determine needed odors, tastes and touches.
16. Compiles needed sensory inputs to develop storyboard.
17. Translates storyboard to develop presentation specifications.
18. Transmit specifications to producer.

4.09.07 Given an implemented problem solution, (specifications for a multi-media presentation) the learner will evaluate that solution. (compare that solution with the standards and parameters set up in objective 4.02.04)

(A): The learner will select or devise criteria for an acceptable evaluation.

(B): The learner will carry out the evaluation specified.

(C): The learner will compare the evaluation with the criteria established in (A).

Representative Tasks:

1. Evaluates procedured multi-media presentation to see if it meets specifications.

Learning Goal 4.02; to improve instruction through the systems approach:

Required responsibility level: Various possible outputs are described that can meet stated technical or administrative needs. The worker must investigate the various possible outputs and evaluate them in regard to performance characteristics and input demands. This usually requires his creative use of theory well beyond referring to standard sources. There is no specification of inputs, methods, sequences, sources, or the like.

Required data skills: ANALYZING: The learner is able to examine and evaluate data (about things, data, or people) with reference to the criteria standards, and/or requirements of a particular discipline, art, technique, or craft to determine interaction effects (consequences) and to consider alternatives.

TAKING INSTRUCTIONS-HELPING: The learner is able to attend to the work assignment, instructions, or orders of supervisors. No immediate response or verbal exchange is required unless clarification of instruction is needed.

EXCHANGING INFORMATION: The learner is able to talk to, converse with, and/or signal people to convey or obtain information, or to clarify and work out details of an assignment, within the framework of well-established procedures.

CONSULTING: The learner is able to serve as a source of technical information and give such information or provides ideas to define, clarify, enlarge upon, or sharpen procedures, capabilities, or product specifications.

INSTRUCTING: The learner is able to teach subject matter to others, or train others, including animals, through explanation, demonstration, practice, and test.

TREATING: The learner is able to act on or interact with individuals or small groups of people or animals who need help (as in sickness) to carry out speciaized therapeutic or adjustment procedures. Systematically observes results of treatment within the framework of total personal behavior because unique individual reactions to prescriptions (chemical, physician's behavioral) may not fall within the range of prediction. Motivate, support, and instruct individuals to accept or cooperate with therapeutic adjustment procedures, when necessary.

Required General Educational Development:

1. The learner must:

* Have knowledge of a field of study (engineering, literature, history, business administration) having immediate applicability to the affairs of the world.

* Define problems, collect data, establish facts, and draw valid conclusions.

* Interpret an extensive variety of technical material in books, manuals, texts, etc.

* Deal with some abstract but mostly concrete variables.

2. The learner must be able to count to simple addition and subtraction; read, copy, and/or record figures.

3. The learner must:

* Have language ability to take and transcribe dictation, make appointments, and sort, route, and file the mail according to subject.
* Write routine business correspondence reflecting standard procedures.
* Interview job applicants to determine work best suited for their abilities and experience; contact employers to interest them in services of agency.
* Understand technical manuals and verbal instructions, as well as drawings and specifications, associated with practicing a craft.
* Guide people on tours through historical or public buildings, tell relevant anecdotes, etc.
* Conduct opinion research surveys involving stratified samples of the population.

The learner must:

* Report, write, or edit articles for magazines which, while popular, are of a highly literate nature (e.g., The New Yorker, Saturday Review, Scientific American).
* Prepare and deliver lectures for audiences that seek information about the arts, sciences, and humanities in an informal way.
* Report news for the newspapers, radio, or TV.
* Write copy for advertising.
* Write instructions and specifications concerning proper use of machinery.
* Write instructions for assembly of prefabricated parts into units.

Behavioral Objectives:

4.10 Unit objective: Given an array of instructional situations with problems, one of which is a problem requiring as a solution the Improve Instruction through the Systems Approach as a solution, the learner will identify that design problem and determine the purposes, outcomes, standards and procedures for implementation of the problem solution.

4.10.01 Given an array of instructional situations, one of which requires the Improve Instruction through the Systems Approach, the learner will correctly identify that situation.

(A): The learner will select or devise criteria for instructional problems requiring the Improve Instruction through the Systems Approach as a solution.

(B): The learner will select that problem requiring, as a solution, the Improve Instruction through the Systems Approach.

(C): The learner will compare the selected problem with the criteria established in (A).

Representative Tasks:

1. Listens to professor to analyze teaching technique.

2. Observes student behavior to analyze teaching technique.

3. Operates tape recorder to record class proceedings.

4. Uses typewriter and tape recorder to make transcript of proceedings.

4.10.02 Given a situation involving the need to Improve Instruction through the Systems Approach, the learner will write a definition of the problem which meets criteria for design problem definitions.

(A): The learner will select or devise criteria for design problem definitions.

(B): The learner will write the design problem definition.

(C): The learner will compare his definition with criteria established in (A).

Representative Tasks:

1. Discusses with professor to define problem area.

2. Discusses with professor to define target population.

3. Discusses with professor to define general objectives.

4.10.03 Given then above definition and criteria for problem solution standards and parameters, the learner will select and/or devise standards and parameters which meet those criteria.

(A): The learner will select or devise criteria for problem solution(s).

(B): The learner will select or devise problem solution standards and parameters.

(C): The learner will compare those problem solution standards and parameters with criteria established in (A).

Representative Tasks:

1. Analyzes potential audience to state assumptions about learners.

2. Discusses with client to identify essential objectives.

4.10.04 Given the standards and/or parameters for the design problem solution(s), (to Improve Instruction through the Systems Approach the learner will specify the solution(s) which meet those standards and parameters.

(A): The learner will select as devise criteria for problem solution(s).

(B): The learner will select and/or devise solution(s) which involves the improvement of instruction through the systems approach.

(C): The learner will compare solution(s) selected with criteria established in (A).

Representative Tasks:

1. Analyzes potential audience to make assumptions about learners.
2. Analyzes content to select model or paradigm.
3. Analyzes presentation technique to select teaching/learning model.

4.10.05 Given a tentative solution which is to Improve Instruction through the Systems Approach, the learner will select and/or devise procedures for implementing that solution.

(A): The learner will select or devise criteria for procedures which do implement the solution.

(B): The learner will select and/or devise implementation procedures.

(C): The learner will compare procedures with criteria developed in (A).

Representative Tasks:

1. Discusses with client to determine strategies.

4.10.06 Given the above procedures, the learner will follow those procedures to Improve Instruction through the Systems Approach to solve the problem.

(A): The learner will select or devise criteria for evaluating whether or not the procedures for implementation have been followed.

(B): The learner will follow the procedures and design programmed instruction materials.

(C): The learner will compare the procedures followed to design programmed instruction materials with criteria devised in (A).

Representative Tasks:

1. Listens and watches professor to analyze teaching technique.
2. Observes student behavior to analyze teaching technique.

3. Operates tape recorder to record class proceedings.
4. Uses taperecorder and typewrites to make transcript of proceedings.
5. Analyzes lecture to derive course objectives.
6. Discusses with professor to confirm validity of objectives.
7. Analyzes objectives to define conditions of learning.
8. Discusses with students to ascertain visuals needed.
9. Rough sketches visuals to illustrate course content.
10. Locates artifacts in museum to illustrate course content.
11. Locates visuals in books to illustrate course content.
12. Operates copy camera to make slides of visuals.
13. Locates commercial materials to illustrate course content.
14. Writes to producer to request materials for preview.
15. Operates projector to preview film.
16. Arranges material in sequence to illustrate course content.

4.10.07 Given an implemented problem solution, (improved instruction via the Systems Approach) the learner will evaluate that solution. (compare that solution with the standards and parameters set up in objective 4.02.04).

(A): The learner will select or devise criteria for an acceptable evaluation.

(B): The learner will carry out the evaluation specified.

(C): The learner will compare the evaluation with the criteria established in (A).

Representative Tasks:

1. Give objectives and pilot demonstrations to evaluator to determine failure/success.

Learning Goal 4.11; to design equipment systems:

Required responsibility level: Output (product or service), is specified in the assignment, which may be in the form of a memorandum or of a schematic (sketch or blueprint). The worker must work out his own ways of getting the job done, including selection of tools and equipment, sequence of operations (tasks), and obtaining important information (handbooks, etc.). He may either carry out work himself or set up standards and procedures for others.

In addition the worker is expected to know and employ theory so that he understands the whys and wherefores of the various options that are available for dealing with a problem and can independently select from among them. He may have to do some reading in the professional and/or trade literature in order to gain this understanding.

Required data skills: ANALYZING: The learner is able to examine and evaluate data (about things, data, or people) with reference to the criteria standards, and/or requirements of a particular discipline, art, technique, or craft to determine interaction effects (consequences) and to consider alternatives.

COORDINATING: The learner is able to decide time, place, and sequence of operations of a process, system, or organization and /or the need for revision of goals, policies (boundary conditions), or procedures, on the basis of analysis of data and of performance review of pertinent objectives and requirements. Includes executing decisions and/or reporting on events.

Required people skills: TAKING INSTRUCTIONS-HELPING: The learner is able to attend to the work assignment, instructions, or orders of supervisors. No immediate response or verbal exchange is required unless clarification of instruction is needed.

Required General Educational Development:

1. The learner must:

* Have knowledge of a field of study (engineering, literature, history, business administration) having immediate applicability to the affairs of the world.

* Define problems, collect data, establish facts, and draw valid conclusions.

* Interpret an extensive variety of technical material in books, manuals, texts, etc.

* Deal with some abstract but mostly concrete variables.

2. The learner must be able to make arithmetic calculations involving fractions, decimals, and percentages.

3. The learner must:

* Have language ability to take and transcribe dictation, make appointments, and sort, route, and file the mail according to subject.

*Write routine business correspondence reflecting standard procedures.

* Interview job applicants to determine work best suited for their abilities and experience; contact employers to interest them in services of agency.

* Understand technical manuals and verbal instructions, as well as drawings and specifications, associated with

practicing a craft.

* Guide people on tours through historical or public buildings, tell relevant anecdotes, etc.

* Conduct opinion research surveys involving stratified samples of the population.

Behavioral Objectives:

4.11 Unit objective: Given an array of instructional situations with problems, one of which is a problem requiring as a solution to design equipment systems as a solution, the learner will identify that design problem and determine the purposes, outcomes, standards and procedures for implementation of the problem solution.

4.11.01 Given an array of instructional situations, one of which requires to design equipment systems, the learner will correctly identify that situation.

(A): The learner will select or devise criteria for instructional problems requiring to design equipment systems as a solution.

(B): The learner will select that problem requiring, as a solution, to design equipment systems.

(C): The learner will compare the selected problem with the criteria established in (A).

Representative Tasks:

1. Analyzes organization goals to determine needs.

4.11.02 Given a situation involving the need for to design equipment systems, the learner will write a definition of the problem which meets criteria for design problem definitions.

(A): The learner will select or devise criteria for design problem definitions.

(B): The learner will write the design problem definition.

(C): The learner will compare his definition with criteria established in (A).

Representative Tasks:

1. Analyzes organization goals to determine needs.

4.11.03 Given the above definition and criteria for problem solution standards and parameters, the learner will select and/or devise standards and parameters which meet those criteria.

(A): The learner will select or devise criteria for problem solution(s).

(B): The learner will select or devise problem solution standards and parameters.

(C): The learner will compare those problem solution standards and parameters with criteria established in (A).

Representative Tasks:

1. Translates communication needs to identify technical systems.
2. Writes general specifications to describe technical systems.
3. Analyzes other equipment systems to determine external constraints.
4. Analyzes ~~physical~~ facilities to determine internal constraints.
5. Analyzes monetary considerations to determine financial constraints.
6. Listens in meetings to understand political aspects.

4.11.04 Given the standards and/or parameters for the design problem solution(s), the learner will specify the solution(s) which meet those standards and parameters.

(A): The learner will select as devise criteria for problem solution(s).

(B): The learner will select and/or devise solution(s) which involves to design equipment systems.

(C): The learner will compare solution(s) selected with criteria established in (A).

Representative Tasks:

1. Analyzes constraints to identify alternate systems.
2. Analyzes constraints to identify alternate formats.
3. Examines alternate systems to develop initial budget.
4. Projects system growth to develop projected budget.
5. Discusses with engineer to determine interface of systems.
6. Analyzes content to select model or paradigm.

4.11.05 Given a tentative solution which is to design equipment systems, the learner will select and/or devise procedures for implementing that solution.

(A): The learner will select or devise criteria for procedures which do implement the solution.

(B): The learner will select and/or devise implementation procedures.

(C): The learner will compare procedures with criteria developed in (A).

Representative Tasks:

1. Discusses with engineer to determine interface of systems.
2. Discusses with client to determine implementation strategies.

4.11.06 Given the above procedures, the learner will follow those procedures to design equipment systems which solve the problem.

(A): The learner will select or devise criteria for evaluating whether or not the procedures for implementation have been followed.

(B): The learner will follow the procedures and design equipment systems.

(C): The learner will compare the procedures followed to design equipment systems with criteria devised in (A).

Representative Tasks:

1. Analyzes goals of organization to determine communication needs.
2. Translates communication needs to identify technical systems.
3. Writes general specifications to describe technical systems.
4. Analyzes other equipment systems to determine external constraints.
5. Analyzes physical facilities to determine physical constraints.
6. Analyzes monetary considerations to determine finanical constraints.
7. Analyzes constraints to identify alternate systems.
8. Analyzes constraints to identify alternate formats.
9. Examines alternate systems to develop initial budget.
10. Projects system growth to develop projected budget.
11. Discusses with engineer to determine interface of systems.
12. Reads technical flyers to identify components of system.
13. Reads technical flyers to determine electrical interface.
14. Reads technical flyers to determine physical interface.

15. Selects components to meet interface requirements.

16. Analyzes physical constraints to draw physical schematic.

17. Analyzes electrical details to draw wiring diagrams.

18. Writes detailed specifications to describe system components.

4.11.07 Given an implemented problem solution, (a designed equipment system) the learner will evaluate that solution. (compare that solution with the standards and parameters set up in objective 4.02.04).

(A): The learner will select or devise criteria for an acceptable evaluation.

(B): The learner will carry out the evaluation specified.

(C): The learner will compare the evaluation with the criteria established in (A).

Representative Tasks:

(No tasks listed in study.)

Learning Goal 4.12; to design improved training equipment:

Required responsibility level: Output (product or service), is specified in the assignment, which may be in the form of a memorandum or of a schematic (sketch or blueprint). The worker must work out his own ways of getting the job done, including selection of tools and equipment, sequence of operations (tasks), and obtaining important information (handbooks, etc.). He may either carry out work himself or set up standards and procedures for others.

In addition the worker is expected to know and employ theory so that he understands the whys and wherefores of the various options that are available for dealing with a problem and can independently select from among them. He may have to do some reading in the professional and/or trade literature in order to gain this understanding.

Required data skills: ANALYZING: The learner is able to examine and evaluate data (about things, data, or people) with reference to the criteria standards, and/or requirements of a particular discipline, art, technique, or craft to determine interaction effects (consequences) and to consider alternatives.

COORDINATING: The learner is able to decide time, place, and sequence of operations of a process, system, or organization and/or the need for revision of goals, policies (boundary conditions), or procedures, on the basis of analysis of data and of performance review of pertinent objectives and requirements. Includes executing decisions and/or reporting on events.

Required things skills: HANDLING: The learner is able to work (cuts, shapes, assemble, etc.) dig, move, or carry objects or materials where objects, materials, tools, etc., are one or few in number and are the primary involvement of the worker; precision requirements are relatively gross, includes the use of dollies, handtrucks, and the like.

FEEDING-OFFBEARING: The learner is able to start, stop, and monitor the functioning of machines and equipment set up by other workers, where the precision of output depends on keeping of to several controls in adjustment, in response to automatic signals according to specifications. Includes workers in all machine situations where there is no significant setup or change of setup, cycles are very short, alternatives to non-standard performance are few, and adjustments are highly prescribed.

PRECISION WORKING: The learner is able to work, move, guide, or place objects or materials according to standard practicial procedures, where the number of objects, materials, tools, etc., embraces an entire craft and accuracy expected is within final finished tolerances established for the craft.

SETTING UP: The learner is able to read machines or equipment to perform their functions, change their performance, or restore their proper functioning if they break down by installing or altering jigs, fixtures, attachments, etc., according to job order or blueprint specifications; accuracy only partly dependent on setup - may involve one or a number of machines for other workers or for worker's own operations.

Required General Educational Development:

1. The learner must:

* Have knowledge of a field of study (engineering, literature, history, business administration) having immediate applicability to the affairs of the world.

* Define problems, collect data, establish facts, and draw valid conclusions.

* Interpret an extensive variety of technical material in books, manuals, texts, etc.

* Deal with some abstract but mostly concrete variablas.

2. The learner must be able to count to simple addition and subtraction; read, copy, and/or record figures.

3. The learner must:

* Have language ability to take and transcribe dictation, make appointments, and sort, route, and file the mail according to subject.

* Write routine business correspondence reflecting standard procedures.

* Interview job applicants to determine work best suited for their abilities and experience; contact employers to

interest them in services of agency.

* Understand technical manuals and verbal instructions, as well as drawings and specifications, associated with practicing a craft.

* Guide people on tours through historical or public buildings, tell relevant anecdotes, etc.

* Conduct opinion research surveys involving stratified samples of the population.

The learner must:

* Report, write, or edit articles for magazines which, while popular, are of a highly literate nature (e.g., *The New Yorker*, *Saturday Review*, *Scientific Amerfcan*).

* Prepare and deliver lectures for audiences that seek information about the arts, sciences, and humanities in an informal way.

* Report news for the newspapers, radio, or TV.

* Write copy for advertising.

* Write instructions and specifications concerning proper use of machinery.

* Write instructions for assembly of prefabricated parts into units.

Behavioral Objectives:

4.12 Unit objective: Given an array of instructional situations with problems, one of which is a problem requiring as a solution the design of improved training equipment as a solution, the learner will identify that design problem and determine the purposes, outcomes, standards and procedures for implementation of the problem solution.

4.12.01 Given an array of instructional situations, one of which requires the design of improved training equipment, the learner will correctly identify that situation.

(A): The learner will select or devise criteria for instructional problems requiring the design of improved training equipment as a solution.

(B): The learner will select that problem requiring, as a solution, the design of improved training equipment.

(C): The learner will compare the selected problem with the criteria established in (A).

Representative Tasks:

1. Observes class to evaluate equipment needs.
2. Discusses with client to define problem area.
3. Questions client to delimit problem area.

4. Reads client's current materials to research problem area.

4.12.02 Given a situation involving the need for designing improved training equipment the learner will write a definition of the problem which meets criteria for design problem definitions.

(A): The learner will select or devise criteria for design problem definitions.

(B): The learner will write the design problem definition.

(C): The learner will compare his definition with criteria established in (A).

Representative Tasks:

1. Writes criteria for needed device.

4.12.03 Given the above definition and criteria for problem solution standards and parameters, the learner will select and/or devise standards and parameters which meet those criteria.

(A): The learner will select or devise criteria for problem solution(s).

(B): The learner will select or devise problem solution standards and parameters.

(C): The learner will compare those problem solution standards and parameters with criteria established in (A).

Representative Tasks:

1. Writes criteria for needed device to ensure compatability with system.

4.12.04 Given the standards and/or parameters for the design problem solution(s), (improved training equipment) the learner will specify the solution(s) which meet those standards and parameters.

(A): The learner will select or devise criteria for problem solution(s).

(B): The learner will select and/or devise solution(s) which involves designing improved training equipment.

(C): The learner will compare solution(s) selected with criteria established in (A).

Representative Tasks:

1. Writes criteria for needed devise to ensure compatability with system.

2. Analyzes equipment systems to locate existing devices.

3. Translates criteria for device to develop technical specifications.

4. Compare devices with specifications to choose most appropriate.

4.12.05 Given a tentative solution which is designing improved training equipment, the learner will select and/or devise procedures for implementing that solution.

(A): The learner will select or devise criteria for procedures which do implement the solution.

(B): The learner will select and/or devise implementation procedures.

(C): The learner will compare procedures with criteria developed in (A).

Representative Tasks:

(None listed in study.)

4.12.06 Given the above procedures, the learner will follow those procedures to design improved training equipment which solves the problem.

(A): The learner will select or devise criteria for evaluating whether or not the procedures for implementation have been followed.

(B): The learner will follow the procedures and design improved training equipment.

(C): The learner will compare the procedures followed as to design improved training equipment.

Representative Tasks:

1. Writes criteria for needed device to ensure compatibility with system.

2. Translates criteria for device to develop technical specifications.

3. Compares devices with technical specifications to choose most appropriate.

4. Designs prototype device to meet technical specifications.

5. Assembles prototype to test design feasibility.

6. Assigns prototype to field center to test design feasibility.

7. Performs cost analysis to compute cost product data.

8. Writes technical specifications for contract to initiate production devices.

4.12.07 Given an implemented problem solution, (improved training equipment) the learner will evaluate that solution. (compare that solution with the standards and parameters set up in objective 4.02.04)

(A): The learner will select or devise criteria for an acceptable evaluation.

(B): The learner will carry out the evaluation specified.

(C): The learner will compare the evaluation with the criteria established in (A).

Representative Tasks:

(None listed in study)

Learning Goal 4.13; to design new facilities:

Required responsibility level: Output (product or service), is specified in the assignment, which may be in the form of a memorandum or of a schematic (sketch or blueprint). The worker must work out his own ways of getting the job done, including selection of tools and equipment, sequence of operations (tasks), and obtaining important information (handbooks, etc.). He may either carry out work himself or set up standards and procedures for others.

In addition the worker is expected to know and employ theory so that he understands the whys and wherefores of the various options that are available for dealing with a problem and can independently select from among them. He may have to do some reading in the professional and/or trade literature in order to gain this understanding.

Required data skills: ANALYZING: The learner is able to examine and evaluate data (about things, data, or people) with reference to the criteria standards, and/or requirements of a particular discipline, art, technique, or craft to determine interaction effects (consequences) and to consider alternatives.

Required people skills: TAKING INSTRUCTIONS-HELPING: The learner is able to attend to the work assignment, instructions, or orders of supervisors. No immediate respone or verbal exchange is required unless clarification of instruction is needed.

Required General Educational Development:

1. The learner must:

* Have knowledge of a system or interrelated procedures, such as bookkeeping, internal combustion engines, electric wiring systems, nursing, farm management, ship sailing, or matching.

* Apply principles to solve practicial, everyday problems and deal with a variety of concrete variables in situations where only limited standardization exists.

* Interpret a variety of instructions furnished in written, oral, diagrammatic, or schedule form.

2. The learner must be able to count to simple addition and subtraction; read, copy and/or record figures.

3. The learner must:

* Have language ability to take and transcribe dictation, make appointments, and sort, route, and file the mail according to subject.
* Write routine business correspondence reflecting standard procedures.
* Interview job applicants to determine work best suited for their abilities and experience; contact employers to interest them in services of agency.
* Understand technical manuals and verbal instructions, as well as drawings and specifications, associated with practicing a craft.
* Guide people on tours through historical or public buildings, tell relevant anecdotes, etc.
* Conduct opinion research surveys involving stratified samples of the population.

Behavioral Objectives:

4.13 Unit objective: Given an array of instructional situations with problems, one of which is a problem requiring as a solution the design of new facilities as a solution, the learner will identify that design problem and determine the purposes, outcomes, standards and procedures for implementation of the problem solution.

4.13.01 Given an array of instructional situations, one of which requires the design of new facilities, the learner will correctly identify that situation.

(A): The learner will select or devise criteria for instructional problems requiring the design of new facilities as a solution.

(B): The learner will select that problem requiring, as a solution, the design of new facilities.

(C): The learner will compare the selected problem with the criteria established in (A).

Representative Tasks:

1. Analyzes work to be done to specify design needs.

4.13.02 Given a situation involving the need for designing new facilities the learner will write a definition of the problem which meets criteria for design problem definitions.

(A): The learner will select or devise criteria for design problem definitions.

(B): The learner will write the design problem definition.

(C): The learner will compare his definition with criteria established in (A).

Representative Tasks:

1. Analyzes work to be done to specify design needs.
2. Analyzes equipment systems to determine space requirements.

4.13.03 Given the above definition and criteria for problem solution standards and parameters, the learner will select and/or devise standards and parameters which meet those criteria.

(A): The learner will select or devise criteria for problem solution(s).

(B): The learner will select or devise problem solution standards and parameters.

(C): The learner will compare those problem solution standards and parameters with criteria established in (A).

Representative Tasks:

1. Analyzes work to do done to specify design needs.
2. Analyzes equipment systems to determine space requirements.
3. Examines current floor plans to determine space constraints.
4. Analyzes budget to determine cost constraints.
5. Analyzes physical construction to determine physical constraints.
6. Analyzes equipment specifications to determine special requirements.

4.13.04 Given the standards and/or parameters for the design problem solution(s), the learner will specify the solution(s) which meet those standards and parameters.

(A): The learner will select as devise criteria for problem solution(s).

(B): The learner will select and/or devise solution(s) which involves designing new facilities.

(C): The learner will compare solution(s) selected with criteria established in (A).

Representative Tasks:

1. Visits other facilities to get design ideas.
2. Reads brochures to identify best designs.

4.13.05 Given a tentative solution which is designing new facilities, the learner will select and/or devise procedures for implementing that solution.

(A): The learner will select or devise criteria for procedures which do implement the solution.

(B): The learner will select and/or devise implementation procedures.

(C): The learner will compare procedures with criteria developed in (A).

Representative Tasks:

1. Discusses with client to determine strategies.

4.13.06 Given the above procedures, the learner will follow those procedures to design new facilities which solve the problem.

(A): The learner will select or devise criteria for evaluating whether or not the procedures for implementation have been followed.

(B): The learner will follow the procedures and design new facilities.

(C): The learner will compare the procedures followed as to design new facilities with criteria devised in (A).

Representative Tasks:

1. Analyzes work to be done to specify desing needs.
2. Analyzes equipment systems to determine space requirements.
3. Examines current floor plans to determine space constraints.
4. Analyzes budget to determine cost constraints.
5. Analyzes physical construction to determine physical constraints.
6. Analyzes equipment specifications to determine speical requirements.
7. Visits other facilities to get ideas for design.
8. Reads brochures to identify best designs.
9. Draws rough floor plan to communicate design needs.
10. Discusses with architect to clarify design needs.

11. Examines blueprints to suggest improvements.

4.13.07 Given an implemented problem solution, (new facilities) the learner will evaluate that solution (compare that solution with the standards and parameters set up in objective 4.02.04).

(A): The learner will select or devise criteria for an acceptable evaluation.

(B): The learner will carry out the evaluation specified.

(C): The learner will compare the evaluation with the criteria established in (A).

Representative Tasks:

(None listed in study.)

Learning Goal 4.14; to design instructional space:

Required responsibility level: Output (product or service), is specified in the assignment, which may be in the form of a memorandum or of a schematic (sketch or blueprint). The worker must work out his own ways of getting the job done, including selection of tools and equipment, sequence of operations (tasks), and obtaining important information (handbooks, etc.). He may either carry out work himself or set up standards and procedures for others.

In addition the worker is expected to know and employ theory so that he understands the whys and wherefores of the various options that are available for dealing with a problem and can independently select from among them. He may have to do some reading in the professional and/or trade literature in order to gain this understanding.

Required data skills: ANALYZING: The learner is able to examine and evaluate data (about things, data, or people) with reference to the criteria standards, and/or requirements of a particular discipline, art, technique, or craft to determine interaction effects (consequences) and to consider alternatives.

Required people skills: TAKING INSTRUCTIONS-HELPING: The learner is able to attend to the work assignment, instructions, or orders of supervisors. No immediate response or verbal exchange is required unless clarification of instruction is needed.

CONSULTING: The learner is able to serve as a source of technical information and give such information or provides ideas to define, clarify, enlarge upon, or sharpen procedures, capabilities, or product specifications.

INSTRUCTING: The learner is able to teach subject matter to others, or train others, including animals, through explanation, demonstration, practice, and test.

TREATING: The learner is able to act on or interact with individuals or small groups of people or animals who need help (as in sickness) to carry out specialized therapeutic or adjustment procedures. Systematically observes results of treatment within the framework of total personal behavior because unique individual reactions to prescriptions (chemical, physician's, behavioral) may not fall within the range of prediction. Motivate, support, and instruct individuals to accept or cooperate with therapeutic adjustment procedures, when necessary.

Required General Educational Development:

1. The learner must:
* Have knowledge of a system or interrelated procedures, such as bookkeeping, internal combustion engines, electric wiring systems, nursing, farm management, ship sailing, or machining.
* Apply principles to solve practicial, everyday problems and deal with a variety of concrete variables in situations where only limited standardization exists.
* Interpret a variety of instructions furnished in written, oral, diagrammatic, or schedule form.

2. The learner must be able to count to simple addition and subtraction; read, copy, and/or record figures.

3. The learner must:
* Read material on level of The Reader's Digest and straight news reporting in popular "mass" newspapers.
* Comprehend ordinary newscasting (uninvolved sentences and vocabulary with focus on events rather than on their analysis).
* Copy verbal material from one record to another, catching gross errors in grammar.
* Fill in report forms, such as Medicare forms, employment applications and card form for income tax.
* Conduct house-to-house surveys to obtain common census-type information or market data, such as preferences for commerical products in everyday use.

Behavioral Objectives:

4.14 Unit objective: Given an array of instructional situations with problems, one of which is a problem requiring as a solution the design instructional space as a solution, the learner will identify that design problem and determine the purposes, outcomes, standards and procedures for implementation of the problem solution.

4.14.01 Given an array of instructional situations, one of which requires the design instructional space, the learner will correctly identify that situation.

(A): The learner will select or devise criteria for instructional problems requiring the design instructional space as a solution.

(B): The learner will select that problem requiring, as a solution, the design instructional space.

(C): The learner will compare the selected problem with the criteria established in (A).

Representative Tasks:

1. Discusses with teachers to define problem area.
2. Questions teacher to delimit problem area.
3. Reads current materials to research problem area.

4.14.02 Given a situation involving the need to design instructional space the learner will write a definition of the problem which meets criteria for design problem definitions.

(A): The learner will select or devise criteria for design problem definitions.

(B): The learner will write the design problem definition.

(C): The learner will compare his definition with criteria established in (A).

Representative Tasks:

1. Discusses with teacher to define problem area.
2. Discusses with teacher to identify instructional pattern.

4.14.03 Given the above definition and criteria for problem solution standards and parameters, the learner will select and/or devise standards and parameters which meet those criteria.

(A): The learner will select or devise criteria for problem solution(s).

(B): The learner will select or devise problem solution standards and parameters.

(C): The learner will compare those problem solution standards and parameters with criteria established in (A).

Representative Tasks:

1. Analyzes instructional pattern to determine space needs.
2. Draws floor plans to meet instructional pattern.

4.14.04 Given the standards and/or parameters for the design problem solution(s), the learner will specify the solution(s) which meet those standards and parameters.

(A): The learner will select as devise criteria for problem solution(s).

(B): The learner will select and/or devise solution(s) which involves designing instructional space.

(C): The learner will compare solution(s) selected with criteria established in (A).

Representative Tasks:

1. Discusses with teachers to identify best floor plan.

4.14.05 Given a tentative solution which is designing instructional space, the learner will select and/or devise procedures for implementing that solution.

(A): The learner will select or devise criteria for procedures which do implement the solution.

(B): The learner will select and/or devise implementation procedures.

(C): The learner will compare procedures with criteria developed in (A).

Representative Tasks:

1. Discusses with client to determine strategies.

4.14.06 Given the above procedures, the learner will follow those procedures to design instructional space which solves the problem.

(A): The learner will select or devise criteria for evaluating whether or not the procedures for implementation have been followed.

(B): The learner will follow the procedures and design instructional space.

(C): The learner will compare the procedures followed as to design instructional space with criteria devised in (A).

Representative Tasks:

1. Discusses with teachers to identify instructional pattern.
2. Analyzes instructional pattern to determine space needs.
3. Draws floor plans to meet instructional pattern.
4. Discusses with teachers to identify best floor plan.
5. Submits chosen floor plan to get approval.

4.14.07 Given an implemented problem solution, (designed instructional space) the learner will evaluate that solution (compare that solution with the standards and parameters set up in objective 4.02.04).

(A): The learner will select or devise criteria for an acceptable evaluation.

(B): The learner will carry out the evaluation specified.

(C): The learner will compare the evalution with the criteria established in (A).

Representative Tasks:

(None listed in study.)

APPENDIX B

Design Outcomes grouping 4.01 -- Analysis of Goals

Unit Objective 4.01 -- Given a training problem, the learner will (1) select/synthesize, and (2) follow, procedures to (a) identify the problem, and (b) set the goals for the solution to the problem, according to (3) selected/synthesized standard design criteria.

Behavioral Objectives and Task/Content/Skill Data for Training

4.01.01 -- Given a set of problem-statement-standards (i.e., standards for how a problem statement ought to be written) and several sample problem statements--some of which meet some standards and some of which don't--the learner will demonstrate an UNDERSTANDING OF THE STANDARDS by correctly identifying which sample problem statements meet each standard, for 90 per cent of the statements.

Content. DIT input should be the standards for how a problem statement ought to be written--a Mager, but on problem-statements rather than on instructional objectives.

4.01.02 -- Given a specific training problem, the learner will SELECT/synthesize the appropriate problem-statement-standards (problem-statement-standards) to apply to the statement of the specific problem.

Skill. Required responsibility level -- with the output specified, the learner uses theory to understand and select among and/or synthesize the inputs, tools and equipment, standards, and procedures necessary to performing the task; he may either carry out the work himself or set up standards and procedures for others.

4.01.03 -- Given a procedure for applying the problem-statement-standards to a specific problem, and several sample procedures--some of which are good and bad examples of the procedure and some of which are not--the learner will demonstrate an UNDERSTANDING OF THE PROCEDURE by correctly identifying the good examples of the procedure for 90 per cent of the examples. (Repeat for each of n procedures that can be used to apply the standards.)

Content. DIT input should be different procedures--e.g., listening to client, discussing with client, analyzing goals, suggesting alternative approaches, reading, gathering data, etc.

4.01.04 -- Given a specific training problem and problem-statement-standard, the learner will SELECT/synthesize the appropriate procedures for applying the problem-statement-standards to the problem.

Skill. Required responsibility level: (see 4.01.02)

4.01.05 -- Given a specific training problem, problem-statement-standards, and a procedure(s) for applying the problem-statement-standards to the problem, the learner will FOLLOW the procedure and STATE the problem so that it meets the problem-statement-standards.

Tasks. DIT Output is indicated by the following tasks:

Gathers office proc. & info............To determine goals for training
Questions client.......................To define wants/needs and their relat.
Questions client.......................To delimit problem area
(Others are listed in the JIMS Curriculum Guidelines.)

Skills. The following Functional Skills and General Education Development are required for performing these tasks.

Functional skills are data, people, and data/people significant. They are required at these levels:

DATA -- ANALYZING -- examines and evaluates with reference to the criteria standards, and/or requirements of a particular discipline, art, technique, or craft to determine interaction effects and to consider alternatives.

PEOPLE -- EXCHANGING INFORMATION -- talks to, converses with people to convey or obtain information, or to clarify and work out details of an arrangement/assignment, within the framework of well-established procedures;

CONSULTING -- serves as a source of technical information and gives such information or provides ideas to define, clarify, enlarge upon, or sharpen procedures, capabilities, or product specifications.

General Educational Development is required at the following levels:

REASONING -- have knowledge of a field of study; define problems, collect data, establish facts, and draw valid conclusions; interpret an extensive variety of technical material in books, etc.; deal with some abstract but mostly concrete variables.

LANGUAGE DEVELOPMENT -- write routine business correspondence; interview job applicants; understand technical manuals and verbal instructions, as well as drawings and specifications, associated with practicing a craft.

4.01.06 -- Given a set of standards for training goals ("standards for training goals") and several sample training goal statements--some of which meet some standards and some of which don't--the learner will demonstrate an UNDERSTANDING OF THE TRAINING GOALS STANDARDS by correctly identifying which sample training goals meet each standard, for 90 per cent of the standards.

Content. DIT input should be the standards for how a training goal ought to be written.

4.01.07 -- Given a specific problem statement, the learner will SELECT/synthesize the appropriate "standards for training goals" to apply to the goals for the solution to the problem.

Skill. Required responsibility level: (see 4.01.02)

4.01.08 -- Given a procedure for applying the "standards for training goals" to a specific problem statement, and several sample procedures--some of which are good and bad examples of the procedure and some of which are not--the learner will demonstrate an UNDERSTANDING OF THE PROCEDURE by correctly identifying the good examples of the procedure for 90 per cent of the examples. (Repeat for each of the possible procedures.)

Content. DIT input should be the different procedures--probably the same as in 4.01.03.

4.01.09 -- Given a specific problem statement and "standards for training goals", the learner will SELECT/synthesize the appropriate procedures for applying the "standards for training goals" to the problem statement.

Skill. Required responsibility level: with the ouput specified, the learner uses theory to understand, and select among and/or synthesize, the inputs, tools, equipment, standards, and procedures necessary to performing the task; he may either carry out the work himself or set up standards and procedures for others. Thus, the learner must be able to decide, for example, to eliminate certain standards for certain learner groups because they do not apply.

4.01.10 -- Given a specific problem statement, "standards for training goals", and a procedure(s) for applying the "standards for training goals" to the problem statement, the learner will FOLLOW the procedure and STATE the goal for the training solution to the problem so that it meets the "standards for training goals."

Tasks. DIT Output is indicated by the following tasks:
Suggests alternative approaches......To define concept for program
Discusses with project director......To ascertain audience/objective
Writes position paper................To set goals of training
(Others are listed in the JIMS Curriculum Guidelines.)

Skills. The Functional Skills and the General Educational Development required for this objective are the same as those required for objective 4.01.05.*

*Note: For this Unit Objective (4.01), the steps 4.01.06-4.01.10 are really a recycling through steps 4.01.01-4.01.05 for the second half of the unit objective.

Design Outcomes grouping 4.02 -- Analysis and Description of Learners

Unit Objective 4.02 -- Given a group of students, the learner will (1) select/synthesize, and (2) follow, procedures to develop profiles of the student population, according to (3) selected/synthesized standard criteria for student profiles.

Behavioral Objectives and Task/Content/Skill Data for Training

4.02.01 -- Given a student-profile-standard, and several sample student profiles--some of which meet the standard and some of which don't--the learner will demonstrate an UNDERSTANDING OF THE STANDARD by correctly identifying which sample student profiles meet the standard for 90 per cent of the samples. (Repeat for each standard.)

Content. DIT Input should be the standards for student profiles--e.g., student profiles should list: socio-economic status, IQ score, reading level, learning style, previous objectives met, etc.

4.02.02 -- Given a specific group of students, the learner will SELECT/synthesize the appropriate student-profile standards (student profile standards) to apply to the development of the student profiles.

Skill. The required responsibility level: with the output specified, the learner uses theory to understand, and select among and/or synthesize, the inputs, tools, equipment, standards, and procedures necessary to performing the task; he may either carry out the work himself or set up standards and procedures for others. Thus, the learner must be able to decide, for example, to eliminate certain standards for certain learner groups because they do not apply.

4.02.03 -- Given a procedure for applying the student profile standards to a specific group of students, and several sample procedures--some of which are good and bad examples of the procedure and some of which are not--the learner will demonstrate an UNDERSTANDING OF THE PROCEDURE by correctly identifying the good examples of the procedure for 90 per cent of the examples. (Repeat for each procedure.)

Content. DIT Input should be different procedures for applying the standards to the group of students--e.g., writing letters, tabulating data, questioning, analyzing.

4.02.04 -- Given a specific group of students and student profile standards, the learner will SELECT/synthesize the appropriate procedures for applying the student profile standards to the specific group.

Skill. Required responsibility level: (see 4.02.02) The learner must be able to decide, for example, that some procedures are appropriate for some standards, while other procedures are appropriate for other standards--and that this can change from group to group.

4.02.05 -- Given a specific group of students, student profile standards, and a procedure(s) for applying the student profile standards to the group of students, the learner will FOLLOW the procedure and develop student profiles so that they meet the student profile standards.

Tasks. DIT Output is indicated by the following tasks:

Writes letters to past students......To develop student profile
Tabulates responses from letters.....To develop student profile
Discusses with client................To define target population
Analyzes potential audience..........To state assumptions about learners

Skills. The following Functional Skills and General Educational Development are required for performing these tasks.

Functional skills are data and data/people significant. They are required at these levels:

DATA -- ANALYZING -- Examines and evaluates with reference to the criteria standards, and/or requirements of a particular discipline, art, craft, or technique to determine interaction effects and to consider alternatives.

PEOPLE -- CONSULTING -- serves as a source of technical information and gives such information or provides ideas to define, clarify, enlarge upon, or sharpen procedures, capabilities, or product specifications.

General Educational Development is required at the following levels:

REASONING -- have knowledge of a field of study; define problems, collect data, establish facts, and draw valid conclusions; interpret an extensive variety of technical material in books, etc.; deal with some abstract but mostly concrete variables.

LANGUAGE DEVELOPMENT -- write routine business correspondence; interview job applicants so as to ascertain qualifications; understand technical manuals and verbal instructions, as well as specifications associated with practicing a craft.

Design Outcomes grouping 4.03 -- Analysis and Description of Content

Unit Objective 4.03 -- Given a body of content, the learner will (1) select/synthesize, and (2) follow, procedures to analyze and organize the content, according to (3) selected/synthesized standard criteria for organizing content into outlines/courses.

Behavioral Objectives and Task/Content/Skill Data for Training

4.03.01 -- Given a standard for organizing content, and several sample organized content outlines/courses--some of which meet the standard and some of which don't--the learner will demonstrate an UNDERSTANDING OF THE STANDARD by identifying which sample organized content outlines/courses meet the standard for 90 per cent of the samples. (Repeat for each standard.)

Content. DIT Input should be standards for organizing content into outlines/courses--eg., logical (or psychological), inductive (or deductive), linear (or spiral), etc.

4.03.02 -- Given a specific body of content, the learner will SELECT/synthesize the appropriate content-organizing-standards (content organizing standards) to apply to analyzing and organizing that body of content.

Skill. Required responsibility level: with the output specified, the learner uses theory to understand, and select among and/or synthesize, the inputs, tools and equipment, standards, and procedures necessary to performing the task; he may either carry out the work himself or set up standards and procedures for others. The learner must be able to decide, for example, to proceed logically, deductively, and linearly for one body of content, while proceeding psychologically, inductively and spirally for another.

4.03.03 -- Given a procedure for applying the content organizing standards to a specific body of content, and several sample procedures--some of which are good and bad examples of the procedure and some of which are not--the learner will demonstrate an UNDERSTANDING OF THE PROCEDURE by correctly identifying the good examples of the procedure for 90 per cent of the samples. (Repeat for each procedure.)

Content. DIT Input should be procedures--eg., visiting, discussing, analyzing, questioning, defining, evaluating, writing, etc.

4.03.04 -- Given a specific body of content and content organizing standards, the learner will SELECT/synthesize the appropriate procedures for applying the content organizing standards to the body of content.

Skill. Required responsibility level: (see 4.03.02.) The learner must be able to decide to, for example, use definition and analysis for mathematics, while using questioning and evaluating for psychology.

4.03.05 -- Given a specific body of content, content organizing standards, and procedure(s) for applying the content organizing standards to the content, the learner will FOLLOW the procedure and ANALYZE AND ORGANIZE the body of content so it meets the content organizing standards.

Tasks. DIT Output is indicated by the following tasks:
Discusses with content experts......To understand content
Visit locality......................To obtain background information
Reads material provided.............To separate into major ideas
Writes summary of major ideas.......To organize content
Writes rough outline of content.....To develop course content
Analyses objectives/flow chart......To write content outline
(Other task statements are listed in the JIMS Curriculum Guidelines.)

Skills. The following Functional Skills and General Educational Development are required for performing these tasks.

Functional skills are data and data/people significant. They are required at these levels:

DATA, ANALYZING -- examines and evaluates data with reference to the criteria standards, and/or requirements of a particular discipline, art, craft, or technique to determine interaction effects (consequences) and to consider alternatives.

PEOPLE, EXCHANGING INFORMATION -- talks to, converses with, and/or signals people to convey or obtain information, or to clarify and work out details of an assignment, within the framework of well established procedures.

CONSULTING -- serves as a source of technical information and gives such information or provides ideas to define, clarify, enlarge upon, or sharpen procedures, capabilities, or product specifications.

General Education Development is required at the following levels:

REASONING -- have knowledge of a field of study having immediate applicability to the affairs of the world; define problems, collect data, establish facts, and draw valid conclusions; interpret an extensive variety of technical material in books, etc.; deal with some abstract but mostly concrete variables.

LANGUAGE -- report, write, or edit articles for magazines which, while popular, are of a highly literate nature; write instructions and specifications concerning proper use of machinery.

Design Outcomes grouping 4.04 -- Definition of Task List

Unit Objective 4.04 -- Given a body of content, the learner will (1) select/synthesize, and (2) follow, procedures to define a task list, according to (3) selected/synthesized standard criteria for task lists.

Behavioral Objectives and Task/Content/Skill Data for Training

4.04.01 -- Given a standard for task lists, and several sample task lists--some of which meet the standard and some of which don't--the learner will DEMONSTRATE AN UNDERSTANDING OF THE STANDARD by correctly identifying which sample task lists meet the standard for 90 per cent of the samples. (Repeat for each standard.)

Content. DIT Input should be the standards for task lists--eg., tasks should be stated as observable behaviors; all tasks have an activity, and outcome, and a purpose; etc.

4.04.02 -- Given a specific body of content, the learner will SELECT/synthesize the appropriate task list standards (task list standards) to apply to the defining of the task list.

Skill. Required responsibility level: with the output specified, the learner uses theory to understand, and select among and/or synthesize, the inputs, tools and equipment, standards and procedures necessary to performing the task; he may either carry out the work himself, or set up standards and procedures for others. The learner must be able to decide, for example, whether different standards apply to data significant tasks from those that apply to things significant ones.

4.04.03 -- Given a procedure for applying the task list standards to the specific body of content, and several sample procedures--some of which are good and bad examples of the procedure and some of which are not--the learner will demonstrate an UNDERSTANDING OF THE PROCEDURE by correctly identifying the good examples of the procedure for 90 per cent of the samples. (Repeat for each procedure.)

Content. DIT Input should be procedures for transforming a body of content into a task list--eg., discuss, analyze. observe, etc.

4.04.04 -- Given a specific body of content and task list standards, the learner will SELECT/synthesize the appropriate procedures for applying the task list standards to the content.

Skill. Required responsibility level (see 4.04.02). The learner must be able to decide which tasks he can observe, which he must discuss, and which he must analyze in the abstract, for example.

4.04.05 -- Given a specific body of content, task list standards, and a procedure(s) for applying the task list standards to the content, the learner will FOLLOW the procedure and define the task list to that it meets the task list standards.

Tasks. DIT Output is indicated by the following tasks:
Identifies planning task force.......To develop task list
Plans conferences....................To develop task list
Discusses with content specialist....To develop associated task list
Analyzes task list...................To group into logical clusters

Skills. The following Functional Skills and General Educational Development are required for performing these tasks.

Functional Skills are Data and People significant. They are required at these levels:

DATA-- ANALYZING -- examines and evaluates data with reference to criteria standards, and/or requirements, of a particular discipline, craft, art, or technique to determine interaction effects (consequences) and to consider alternatives.

PEOPLE -- CONSULTING -- serves as a source of technical information and gives such information or provides ideas to define, clarify, enlarge upon, or sharpen procedures, capabilities, or product specifications.

General Educational Development is required at the following levels:

REASONING -- have knowledge of a field of study having immediate applicability to the affairs of the world; define problems, collect data, establish facts, and draw valid conclusions; interpret an extensive variety of technical material in books, etc.; deal with some abstract but mostly concrete variables.

LANGUAGE -- report, write or edit articles for magazines, which, while popular, are of a highly literate nature; write instructions and specifications concerning proper use of machinery.

Design Outcomes grouping 4.05 -- Specification of Objectives

Unit Objective 4.05 -- Given a body of content and general goals, the learner will (1) select/synthesize, and (2) follow procedures to specify behavioral objectives, according to (3) selected/synthesized standard criteria for behavioral objectives.

Behavioral Objectives and Task/Content/Skill Data for Training

4.05.01 -- Given a standard for behavioral objectives, and several sample behavioral objectives--some of which meet the standard and some of which don't--the learner will demonstrate an UNDERSTANDING OF THE STANDARD by identifying which of the sample objectives meet the standard for 90 per cent of the samples. (Repeat for each standard.)

Content. DIT Input should be standards for behavioral objectives--e.g., Mager's book, or Pophams A, B, C, D, or one of the others available--or a combination of all that are available.

4.05.02 -- Given a specific general goal and body of content, the learner will SELECT/synthesize the appropriate behavioral-objective-standards (behavioral objectives standards) to apply to the specification of the objectives.

Skill. Required responsibility level: with the output specified, the learner uses theory to understand, and select among and/or synthesize, the inputs, tools and equipment, standards, and procedures necessary to performing the task; he may either carry out the work himself, or set up standards and procedures for others. The learner should be able, for example, to synthesize the different approaches to writing behavioral objectives into one that fits his style, the objectives of the project he is working on, the client, etc.

4.05.03 -- Given a procedure for applying the behavioral objectives standards to the specific general goal and body to content, and several sample procedures--some of which are good and bad examples of the procedure and some of which are not--the learner will demonstrate an UNDERSTANDING OF THE PROCEDURE by correctly identifying the good examples of the procedure for 90 per cent of examples. (Repeat for all procedures.)

Content. The DIT Input should be the procedures for specifying behavioral objectives--e.g., discussing, analyzing, translating, breaking down, defining, etc.

4.05.04 -- Given a specific general goal and body of content, and behavioral objectives standards, the learner will SELECT/synthesize the appropriate for applying the behavioral objectives standards to the goal and content.

Skill. Required responsibility level: (see 4.05.02)

4.05.05 -- Given a specific general goal and body of content, behavioral objectives standards, and a procedure(s) for applying the behavioral objectives standards to the goal and content, the learner will FOLLOW the procedure and specify the behavioral objectives so that they meet the behavioral objectives standards.

Tasks. DIT Output is indicated by the following tasks:

Discusses with producer	To define objectives for film
Discusses with client	To identify essential objectives
Analyzes task groups	To expand into behavioral objectives
Analyzes flow chart	To write behavioral objectives
Translates criterion performance	To define learning objectives
Breaks down general objectives	To define behavioral objectives

(Additional tasks are indicated in the JIMS Curriculum Guidelines.)

Skills. The following Functional Skills and General Educational Development are required to perform these tasks.

Functional Skills are data significant and data/people significant. They are required at these levels:

DATA-- ANALYZING -- examines and evaluates data with reference to criteria standards, and/or requirements, of a particular discipline, craft, art, or technique to determine interaction effects (consequences) and to consider alternatives.

PEOPLE -- CONSULTING -- serves as a source of technical information and gives such information or provides ideas to define, clarify, enlarge upon, or sharpen procedures, capabilities, or product specifications.

General Educational Development is required at the following levels:

REASONING -- have knowledge of a field of study having immediate applicability to the affairs of the world; define problems, collect data, establish facts, and draw valid conclusions; interpret an extensive variety of technical material in books, etc.; deal with some abstract, but mostly concrete, variables.

LANGUAGE -- report, write, or edit articles for magazines which, while popular, are of a highly literate nature; write instructions and specifications concerning proper use of machinery.

Design Outcomes grouping 4.06 -- Design of Pre and Post Tests

Unit Objective 4.06 -- Given a set of behavioral objectives, the learner will (1) select/synthesize, and (2) follow, procedures to design pre and post tests, according to (3) selected/synthesized standard criteria for tests.

Behavioral Objectives and Tasks/Content/Skill Data for Training

4.06.01 -- Given a standard for pre and post tests, and several sample tests--some of which meet the standard and some of which don't--the learner will demonstrate an UNDERSTANDING OF THE STANDARD by correctly identifying which sample tests meet the standard for 90 per cent of the samples. (Repeat for each standard.)

Content. DIT Input should be standards for test design--e.g., measure the behavior indicated by the objectives, direct and indirect measures, objective and subjective tests, item construction, etc.

4.06.02 -- Given a specific behavioral objective (set of objectives) the learner will SELECT/synthesize the appropirate pre and post test standards (pre and post test standards) to apply to the design of the tests.

Skill. Required responsibility level: with the output specified, the learner uses theory to understand, and select among and/or synthesize, the inputs, tools and equipment, standards, and procedures necessary to performing the task; he may perform the work himself, or set up standards and procedures for others. The learner should be able to decide whether to direct or indirect measurement, whether to use multiple choice or essay questions, etc.

4.06.03 -- Given a procedure for applying the pre and post test standards to a specific objective(s), and several sample procedures--some of which are good and bad examples of the procedures and some of which are not--the learner will demonstrate an UNDERSTANDING OF THE PROCEDURE by correctly identifying the good examples of the procedure for 90 per cent of the samples. (Repeat for each procedure.)

Content. DIT Input should be procedures for constructing test items--translate objectives, define equivalent behaviors, etc.

4.06.04 -- Given a specific objective(s) and pre and post test standards, the learner will SELECT/synthesize the appropriate procedures for applying the pre and post test standards to the design of the tests.

Skill. Required responsibility level: (see 4.06.02.)

4.06.05 -- Given a specific objective(s), pre and post test standards, and a procedure(s) for applying the pre and post test standards to the objectives, the learner will FOLLOW the procedure and design pre and post tests so that they meet the pre and post test standards.

Tasks. The DIT Output is indicated by the following tasks:
Analyzes test construction............To list characteristics
Analyzes objectives...................To write pre and post tests

Skills. The following Functional Skills and General Educational Development are required for performing these tasks.

Functional Skills are Data significant, and are required at this level:

DATA -- ANALYZING -- examines and evaluates data with reference to critiera standards, and/or requirements, of a particular discipline, art, craft, or technique to determine interactive effects (consequences) and to consider alternatives.

General Educational Development is required at the following levels:

REASONING -- have knowledge of a field of study having immediate applicability to the world's affairs; define problems, collect data, establish facts, and draw valid conclusions; interpret an extensive variety of technical material in books, etc.; deal with some abstract, but mostly concrete, variables.

LANGUAGE -- report, write, or edit articles for magazines which, while popular, are of a highly literate nature; write instructions and specifications concerning proper use of machinery.

Design Outcomes grouping 4.07 -- Sequence of Learning Tasks

Unit Objective 4.07 -- Given a set of tasks/objectives/content, the learner will (1) select/synthesize, and (2) follow, procedures to sequence/organize the learning tasks, according to (3) standard criteria for task sequence.

Behavioral Objectives and Task/Content/Skill Data for Training

4.07.01 -- Given a standard for sequencing learning tasks, and several sample learning task sequences--some of which meet the standard and some of which don't--the learner will demonstrate an UNDERSTANDING OF THE STANDARD by correctly identifying which sample task sequences meet the standard for 90 per cent of the samples. (Repeat for each standard.)

Content. DIT Input should be the standards for sequencing learning tasks--e.g., inductively, deductively, spirally, working forward through the sequence, working backward through the sequence, etc.

4.07.02 -- Given a specific set of tasks (objectives/content), the learner will SELECT/synthesize the appropriate learning-task-sequence-standards (learning task sequence standards) to apply to sequencing these learning tasks.

Skills. Required responsibility level: with the output specified, the learner uses theory to understand, and select among and/or synthesize, the inputs, tools and equipment, standards, and procedures necessary to performing the task; he may perform the work himself, or set up standard and procedures for others. The learner should be able to decide, for example, whether to sequence the tasks inductively or deductively, sequentially or spirally, in forward or reverse sequence for a particular set of tasks.

4.07.03 -- Given a procedure for applying the learning task sequence standards to a specific set of learning tasks, and several sample procedures--some of which are good and bad examples of the procedure and some of which are not--the learner will demonstrate an UNDERSTANDING OF THE PROCEDURE by correctly identifying the good examples of the procedure for 90 per cent of the samples. (Repeat for each procedure.)

Content. DIT Input should be the procedures for sequencing learning tasks--e.g., flowcharting, analyzing objectives, synthesizing tasks, discussing, etc.

4.07.04 -- Given a specific set of learning tasks, and learning task sequence standards, the learner will SELECT/synthesize the appropriate procedures for applying the learning task sequence standards to the tasks.

Skill. Required responsibility level: (see 4.07.02.) The learner must be able to decide which procedure, of those listed above, is appropriate in any given situation.

4.07.05 -- Given a specific set of learning tasks, learning task sequence standards, and a procedure(s) for applying the learning task sequence standards to the tasks, the learner will FOLLOW the procedure and sequence the learning tasks so that the sequence meets the learning sequence standards.

Tasks. DIT Output is indicated by the following tasks:

Asks questions......................	To develop sequence for program
Design Flow Chart.	To develop sequence for program
Writes brief draft of program........	To sequence content
Restates task analysis..............	To design flow chart

Groups curriculum topics..............To assign grade levels
Analyzes current content.............To define alternative procedures
(Additional tasks in JIMS Curriculum Guidelines.)

Skill. The following Functional Skills and General Educational Development are required for these tasks.

Functional Skills are Data and Data/People significant. They are required at these levels:

DATA -- ANALYZING -- examines and evaluates data with reference to criteria standards, and/or requirements, of a particular discipline, art, craft, or technique to determine interactive effects (consequences) and to consider alternatives.

PEOPLE -- CONSULTING -- serves as a source of technical information and gives such information or provides ideas to define, clarify, enlarge upon, or sharpen procedures, capabilities, or product specifications.

General Educational Development is required at the following levels:

REASONING -- have knowledge of a field of study having immediate applicability to the affairs of the world; define problems, collect data, establish facts, and draw conclusions; interpret an extensive variety of technical material in books, etc.; deal with some abstract, but mostly concrete, variables.

MATHEMATICS -- perform ordinary arithmetic, algebraic, and geometric procedures in standard procedures in standard practical applications.

LANGUAGE -- report, write, or edit articles for magazines which, while popular, are of a highly literate nature; write instructions and specifications concerning the proper use of machinery.

Design Outcomes grouping 4.08 -- Selection of Instructional System Components/Instructional Strategies

Unit Objective 4.08 -- Given a content outline and behavioral objectives, the learner will (1) select/synthesize, and (2) follow, procedures to select instructional strategies and instructional-system-components (ISCs), according to standard criteria for strategy and ISC[1] selection.

Behavioral Objectives and Task/Content/Skill Data for Training

4.08.01 -- Given a standard for instructional strategy and ISC selection, and several sample selected strategies and ISCs for objectives--some of which meet the standard and some of which don't--the learner will

[1] ISC is Instructional System Component (See JIMS).

demonstrate an UNDERSTANDING OF THE STANDARD by correctly identifying which sample strategies and ISCs meet the standard for 90 per cent of the samples. (Repeat for each standard.)

Content. DIT input should be the standards for selecting instructional strategies--e.g., those suggested by Gagne & Briggs, those used by Merrill, etc.

4.08.02 -- Given a specific content outline and set of objectives, the learner will SELECT/synthesize the appropriate standards for instructional-strategy-and-ISC-selection to apply to this content and objectives.

Skill. Required responsibility level: with the output specified, the learner uses theory to understand, and select among and/or synthesize, the inputs, tools and equipment, standards and procedures, necessary to do the work; he may perform the work himself, or he may set up standards and procedures for others. The learner should decide which set of strategy/ISC selection standards to use (Gagne, Merrill, other) or to synthesize all of them, and then which specific standards are applicable to the level of content and objective he is dealing with.

4.08.03 -- Given a procedure for applying the instructional-strategy-and-ISC-selection standards to a specific content outline and objective(s), and several sample procedures--some of which are good and bad examples of the procedure and some of which are not--the learner will demonstrate an UNDERSTANDING OF THE PROCEDURE by identifying the good examples of the procedure for 90 per cent of the samples. (Repeat for each procedure.)

Content. DIT input should be procedures--e.g., discuss, analyze, extrapolate, translate, etc.

4.08.04 -- Given a specific content outline and objective(s), and instructional-strategy-ISC-selection standards, the learner will SELECT/synthesize the appropriate procedure for applying the standards to the selection of strategies and ISCs.

Skill. Required responsibility level: (see 4.08.02.)

4.08.05 -- Given a specific content outline and objective(s), standards for instructional-strategy-and-ISC-selection, and a procedure for applying the standards to the content outline, the learner will FOLLOW the procedure and select an instructional strategy and ISC so that the selection meets the standards.

Tasks. DIT Output is indicated by the following tasks:

Discusses with teachers...............	To identify instructional pattern
Analyzes learning modes...............	To list characteristics
Analyzes behavioral objectives........	To select method of instruction
Analyzes content outline..............	To select model/paradigm
Analyzes content outline..............	To select appropriate media

Designs model.......................To clarify method/media decisions
Extrapolates from content/objectives.To define teaching strategies
Assigns modes to objectives..........To provide model for instruction
(Additional tasks in the JIMS Curriculum Guidelines)

Skill. Functional Skills and General Educational Development are required for performing these tasks as indicated below.

Functional Skills are Data and Data/People significant. They are required at the following levels:

DATA -- ANALYZING -- examines and evaluates data with reference to criteria standards, and/or requirements, of a particular discipline, art, craft, or technique to determine interactive effects (consequences) and to consider alternatives.

PEOPLE -- CONSULTING -- serves as a source of technical information and gives such information or provides ideas to define, clarify, enlarge upon, or sharpen procedures, capabilities, or product specifications.

General Educational Development is required at the following levels:

REASONING -- have knowledge of a field of study having immediate applicability to the affairs of the world; define problems, collect data, establish facts, and draw conclusions; interpret an extensive variety of technical material in books, etc.; deal with some abstract, but mostly concrete, variables.

LANGUAGE -- write routine business correspondence; interview job applicants; understand technical manuals and verbal instructions and verbal instructions, as well as drawings and specifications, associated with practicing a craft.

Design Outcomes grouping 4.09 -- Organization of Design Components

Unit Objective 4.09 -- Given a set of ISCs to be designed, the learner will (1) select/synthesize, and (2) follow, procedures to organize/schedule the design of ISCs, according to (3) selected/synthesized standard criteria for ISC-design scheduling.

Behavioral Objectives and Task/Content/Skill Data for Training.

4.09.01 -- Given a standard for scheduling the design of ISCs, and several sample schedules for design--some of which meet the standard and some of which don't--the learner will demonstrate an UNDERSTANDING OF THE STANDARD by correctly identifying which sample schedules meet the standard for 90 per cent of the samples. (Repeat for each standard.)

Content. DIT Input should be standards for design schedules--e.g., maximum and minimum times for the processes involved in the design of each ISC, concurrent design of several ISCs, coordinating finishing of design of all ISCs, etc.

4.09.02 -- Given a specific ISC to be designed, the learner will SELECT/synthesize the appropriate design-schedule-standards (design-schedule standards) to apply to scheduling the design of the ISC.

Skill. Required responsibility level: with the output specified, the learner uses theory to understand, and select among and/or synthesize, the inputs, tools and equipment, standards and procedures, necessary to do the work; he may perform the work himself, or he may set up the standards and procedures for others.

4.09.03 -- Given a procedure for applying the design-schedule standards to a specific set of ISCs, and several sample procedures--some of which are good and bad examples of the procedures and some of which are not--the learner will demonstrate an UNDERSTANDING OF THE PROCEDURE by correctly identifying the good examples of the procedure for 90 per cent of the sample procedures. (Repeat for each procedure.)

Content. DIT Input should be the procedures--e.g., PERT, Gants charts, etc.

4.09.04 -- Given a specific set of ISCs, and design-schedule standards, the learner will SELECT/synthesize the appropirate procedure for applying the design-schedule standards to the ISC design schedule.

Skill. Required responsibility level: (see 4.09.02.) e.g., the learner must be able to decide when the complexity of the design schedule will require PERT, and when it is simple enough to use other procedures.

4.09.05 -- Given a specific set of ISCs, design-schedule standards, and a procedure(s) for applying the design-schedule standards to the ISCs, the learner will FOLLOW THE PROCEDURE and schedule meets the design-schedule standards.

Tasks. DIT Output is indicated by the following task:*
Analyzes content and time.............To write schedule
*NOTE: The JIMS Curriculum Guidelines are lacking in appropriate tasks for this outcome grouping. More need to be generated for training.

Skill. Functional Skills and General Educational Development are required at the following levels for performing these tasks.

Functional Skills are Data Significant. They are required at these levels:

DATA -- ANALYZING -- examines and evaluates data with reference to criteria standards and/or requirements, of a particular discipline, art, craft, or technique to determine interactive effects (consequences) and to consider alternatives.

General Educational Development is required at the following levels:

REASONING -- have knowledge of a field of study having immediate applicability to the affairs of the world; define problems, collect data, establish facts, and draw conclusions; interpret an extensive variety of technical material in books, etc.; deal with some abstract, but mostly concrete variables.

MATHEMATICS -- perform ordinary arithmetic, algebraic, and geometric procedures in standard procedure in standard practical applications.

LANGUAGE -- report, write, or edit articles for magazines which, while popular, are of a literate nature; write instructions and specifications concerning proper use of machinery.

Design Outcome grouping 4.10 -- Specification of Devices

Unit Objective 4.10 -- Given the need for a device in an instructional system, the learner will (1) select/synthesize, and (2) follow, procedures to develop technical specifications for the device, according to (3) selected/synthesized standard criteria for device specifications.

Behavioral Objectives and Tasks/Content/Skill Data for Training

4.10.01 -- Given a standard for device-specifications, and several sample device-specifications--some of which meet the standard and some of which don't--the learner will demonstrate an UNDERSTANDING OF THE STANDARD by identifying which sample device specifications meet the standard for 90 per cent of the samples. (Repeat for each standard.)

Content. DIT Input should be the standard for device specifications--e.g., the form the specifications must be in, how the device must interface with other system components, etc.

4.10.02 -- Given a specific need for a device, the learner will SELECT/synthesize the appropriate device-specification-standards (design-schedule standards) to apply to the design of technical specifications for the device.

Skill. Required responsibility level: with the output specified, the learner uses theory to understand, and select among and/or synthesize, the inputs, tools and equipment, standards and procedures, necessary to perform the task; he may perform the work himself, or he may set up the standards and procedures for others. The learner must be able to decide whether the form of the specifications is important for the person who will receive them, whether interface with other devices or materials is an issue, whether cost is an issue, etc.

4.10.03 -- Given a procedure for applying the design-schedule standards to the need for a specific device, and several sample procedures--some of which are good and bad examples of the procedure and some of which are not--the learner will demonstrate an UNDERSTANDING OF THE PROCEDURE by correctly identifying the good examples of the procedure for 90 per cent of the examples. (Repeat for each procedure.)

Content. DIT Input should be procedures for devloping device specifications--e.g., reading technical material, discussing, analyzing, translating, diagramming, etc.

4.10.04 -- Given a specific need for a device, and design-schedule standards, the learner will SELECT/synthesize the appropriate procedures for applying the design-schedule standards to the development of device specifications.

Skill. Required responsibility level: (see 4.10.02.) The learner must be able to decide, for example, when to stop reading and analyzing and when to start analyzing and translating; he must decide when to draw schematics and when not, etc.

4.10.05 -- Given a specific need for a device, design-schedule standards, and a procedure for applying the design-schedule standards to the need for a device, the learner will FOLLOW THE PROCEDURE and develop technical specifications for the device, so that it meets the design-schedule standards.

Tasks. DIT Output is indicated by the following tasks:

Asks questions of engineers	To determine technical specifications
Discusses with engineer	To determine interface of systems
Reads technical flyers	To determine electrical interface
Reads technical flyers	To identify components of system
Analyzes physical constraints	To draw schematic
Analyzes constraints	To identify alternate formats
Writes criteria for needed device	To ensure compatability with system
Writes general specifications	To describe technical systems

(Additional tasks in JIMS Curriculum Guidelines.)

Skill. The following Functional Skills and General Educational Development are required for these tasks.

Functional Skills are Data and Data/People significant. They are required at the following levels:

DATA -- ANALYZING -- examines and evaluates data with reference to the criteria standards, and/or requirements of a particular discipline, art, craft, or technique to determine interaction (consequences) and to consider alternatives.

PEOPLE EXCHANGING INFORMATION -- talks to, converses with people to convey or obtain information, or to clarify or work out details of an arrangement/assignment, within the framework of well-established procedures.

CONSULTING-- serves as a source of technical information and gives such information or provides ideas to define, clarify, enlarge upon, or sharpen procedures, capabilities, or product specifications.

General Educational Development is required at the following levels:

REASONING -- have knowledge of a field of study having immediate applicability to the affairs of the world; define problems, collect data, establish facts, and draw conclusions; interpret an extensive variety of technical material in books, etc.; deal with some abstract, but mostly concrete variables.

MATHEMATICS -- make arithmetic calculations involving fractions, decimals and percentages.

(perhaps also) 4 -- perform ordinary arithmetic, algebraic, and geometric procedures in standard procedure in standard practical applications.

LANGUAGE DEVELOPMENT -- report, write, or edit articles for magazines which, while popular, are of a highly literate nature; write instructions and specifications concerning proper use of machinery.

Design Outcomes grouping 4.11 -- Specification of Setting

Unit Objective 4.11 -- Given a need for an instructional setting, the learner will (1) select/synthesize, and (2) follow, procedures to determine specifications for instructional settings, according to (3) selected/synthesized standard criteria for setting-specifications.

Behavioral Objectives and Task/Content/Skill Data for Training

4.11.01 -- Given a standard for specification of instructional settings, and several sample setting-specifications--some of which meet the standard and some of which don't--the learner will demonstrate an UNDERSTANDING OF THE STANDARD by correctly identifying which sample setting-specifications meet the standard for 90 per cent of the samples. (Repeat for each standard.)

Content. DIT Input should be standard for specification of instructional settings--e.g., specifications should include (where appropriate) floor area, ceiling height, special floor configurations (wells), furniture, use of already existing facilities, new facilities needed, etc.

4.11.02 -- Given a specific need for an instructional setting, the learner will SELECT/synthesize the appropriate setting-specification-standards (setting specification standards) to apply to the determination of the specifications for the instructional setting.

Skill. Required responsibility level: with the output specified, the learner uses theory to understand, and select among and/or synthesize, the inputs, tools and equipment, standards and procedures necessary to performing the work; he may perform the work himself, or he may set up the standards and procedures for others. The learner must be able to select the appropriate standards for outside settings as opposed to inside ones, and designed versus existing ones.

4.11.03 -- Given a procedure for applying the setting specification standards to the specific need for an instructional setting, and several sample procedure--some of which are good and bad examples of the procedure and some of which are not--the learner will demonstrate an UNDERSTANDING OF THE PROCEDURE by correctly identifying the good examples of the procedure for 90 per cent of the samples. (Repeat for each procedure.)

Content. DIT Input should be procedures--e.g., discussing, analyzing, drawing plans, etc.

4.11.04 -- Given a specific need for an instructional setting, setting specification standards, the learner will SELECT/synthesize the appropriate procedures for applying the setting specification standards to the determination of the specifications.

Skill. Required responsibility level: (see 4.11.02.) The learner must know when to select from off-the-shelf specifications, when to write his own, when to draw plans, when to discuss with others, etc.

4.11.05 -- Given a specific need for an instructional setting, setting specification standards, and a procedure for applying the setting specification standards to the need, the learner will FOLLOW the procedure and determine the specifications for the instructional setting, so that the specifications meet the setting specification standards.

Tasks. DIT Output is indicated by the following tasks:

Discusses with architect	To clarify design needs
Analyzes equipment systems	To determine space requirements
Analyzes instructional pattern	To determine space needs
Analyzes physical construction	To determine physical constraints
Draws floorplan	To communicate design needs
Examines blueprints	To suggest improvements.

(Additional tasks are in JIMS Curriculum Guidelines.)

Skill. The following Functional Skills and General Educational Development are required to perform these tasks.

Functional Skills are Data and Data/People significant. They are required at the following levels:

DATA -- ANALYZING -- examines or evaluates data with reference to criteria standards, and/or requirements of a particular discipline, art, craft, or technique to determine interactive effects (consequences) and to consider alternatives.

PEOPLE -- CONSULTING -- serves as a source of technical information and gives such information or provides ideas to define, clarify, enlarge upon, or sharpen procedures, capabilities, or product specifications.

General Educational Development is required at the following levels:

REASONING -- have knowledge of a system or interrelated procedures; apply principles to solve practical, everyday problems and deal with a variety of concrete variables; interpret a variety of instructions furnished in written, oral, diagrammatic or schedule form.

MATHEMATICS -- perform ordinary arithmetic, algebraic, and geometric procedures in standard procedure in standard applications.

LANGUAGE DEVELOPMENT -- write routine business correspondence; interview job applicants to match work and abilities; understand technical manuals and verbal instructions, as well as drawings and specifications, associated with a craft.

Design Outcomes grouping 4.12 -- Specification of Materials

Unit Objective 4.12 -- Given objectives/content and the need for a specific type of material, the learner will (1) select/synthesize, and (2) follow, procedures to write design specifications for the materials, according to (3) selected/synthesized standard criteria for materials specifications.

Behavioral Objectives and Tasks/Content/Skills Data for Training

4.12.01 -- Given a standard for materials-specifications, and several sample materials-specifications--some of which meet the standard and some of which don't--the learner will demonstrate an UNDERSTANDING OF THE STANDARD by correctly identifying which sample materials-specifications meet the standard for 90 per cent of the samples. (Repeat for each standard.)

Content. DIT Input should be standards for materials-specifications--e.g., must be in storyboard form, must specify each visual, must specify each component of audio, must specify places for student responses, etc.

4.12.02 -- Given a specific objective/content and needed type of material, the learner will SELECT/synthesize the appropriate material-specification-standards (material specification standards) to apply to writing the specifications.

Skill. Required responsibility level: with the output specified, the learner uses theory to understand, and select among and/or synthesize, the inputs, tools and equipment, standards, and procedures necessary to performing the task; he may perform the work himself, or he may set up the standards and procedures for others. The learner must be able to judge, for example, whether learner responses are appropriate for this material, whether several different types of audio are needed, how detailed the storyboard needs to be, etc.

4.12.03 -- Given a procedure for applying the material specification standards to a specific objective/content and type of material, and several sample procedures--some of which are good and bad examples of the procedure and some of which are not--the learner will demonstrate an UNDERSTANDING OF THE PROCEDURE by correctly identifying the good examples of the procedure for 90 per cent of the examples. (Repeat for each procedure.)

Content. DIT Input should be procedures for specifying the design of the materials--e.g., discussing, analyzing content, storyboarding, reviewing existing materials, sketching, etc.

4.12.04 -- Given a specific content/objective and type of material, and material specification standards, the learner will SELECT/synthesize the appropriate procedure for applying the material specification standards to the writing of design specifications.

Skill. Required responsibility level: (see 4.12.02.) The learner must decide whether or not, for example, to consult existing materials, to consult others, to rough out the materials, etc.

4.12.05 -- Given a specific objective/content, material specification standards, and a procedure(s) for applying the material specification standards to the writing of specifications, the learner will FOLLOW THE PROCEDURE and write design specifications for the material so that they meet the material specification standards.

Tasks. DIT Output is indicated by the following tasks:
Discusses with course writers........To increase course illustrations
Discusses with photographer..........To determine visuals needed
Analyzes learning objectives.........To write rough script
Rough sketches images................To convey message of script
Evaluates script.....................To identify needed realia
Analyzes objectives..................To write role plays
Locates commerical materials.........To illustrate content
Synthesizes obj/seq/content/media....To determine needed visuals
Synthesizes obj/seq/content/media....To determine needed audio

Synthesizes obj/seq/content/media....	To determine needed odors, tastes, touches.
Compiles needed sensory inputs.......	To develop storyboard
Translates storyboard................	To develop pres. specifications

(Additional tasks are in JIMS Curriculum Guidelines.)

Skills. The following Functional Skills and General Educational Development are needed for performing these tasks.

Functional Skills are Data and Data/People significant. They are required at the following levels:

DATA -- ANALYZING -- examines or evaluates data with reference to criteria standards, and/or requirements of a particular discipline, art, craft, or technique to determine interactive effects (consequences) and to consider alternatives.

PEOPLE -- CONSULTING -- serves as a source of technical information and gives such information or provides ideas to define, clarify, enlarge upon, or sharpen procedures capabilities, or product specifications.

General Educational Development is required at the following levels:

REASONING -- have knowledge of a field of study having immediate applicability to the affairs of the world; define problems, collect data, establish facts, and draw conclusions; interpret an extensive variety of technical material in books, etc.; deal with some abstract, but mostly concrete, variables.

LANGUAGE DEVELOPMENT -- report, write, or edit articles for magazines which, while popular, are of a highly literate nature; write instruction and specifications concerning proper use of machinery.

Design Outcomes grouping 4.13 -- Design/Arrangement of Materials

Unit Objective 4.13 -- Given a visual material to be designed, the learner will (1) select/synthesize, and (2) follow, procedures to design/arrange the visual material, according to (3) selected/synthesized standard criteria for visual-material-design/arrangement.

Behavioral Objectives and Tasks/Content Skill Data for Training

4.13.01 -- Given a standard for visual-material-design/arrangement, and several sample visual material designs/arrangements--some of which meet the standard and some of which don't--the learner will demonstrate an UNDERSTANDING OF THE STANDARD by correctly identifying which designs/arrangements meet the standards for 90 per cent of the samples. (Repeat for each standard.)

Content. DIT Input should be standards for design and arrangement of visual materials--e.g., standards for color, for size, for sequencing, for lettering, for matching with audio.

4.13.02 -- Given a specific visual material to be designed, the learner will SELECT/synthesize the appropriate visual-material-design standard (visual material design standards) to apply to the design/arrangement of the material.

Skill. Required responsibility level: with the output specified, the learner uses theory to understand, and select among and/or synthesize, the inputs, tools and equipment, standards, and procedures necessary to performing tasks; he may perform the work himself, or he may set up the standards and procedures for others. The learner must be able to decide, for example, to use a different set of color standards for black and white TV, color TV, and a film.

4.13.03 -- Given a procedure for applying the visual material design standards to a specific material design, and several sample procedures--some of which are good and bad examples of the procedure and some of which are not--the learner will demonstrate an UNDERSTANDING OF THE PROCEDURE by correctly identifying the good examples of the procedure for 90 per cent of the samples. (Repeat for each procedure.)

Content. DIT Input should be procedures--e.g., drawing, analyzing, selecting, locating, lettering, etc.

4.13.04 -- Given a specific visual material to be designed, and visual material design standards, the learner will SELECT/synthesize the appropriate procedure(s) for applying the visual material design standards to the design of the material.

Skill. Required responsibility level: (see 4.13.02.) The learner must be able to select the procedure appropriate to the material.

4.13.05 -- Given a specific material to be designed/arranged, visual material design standards, and a procedure for applying the visual material design standards to the design/arrangement of the material, the learner will FOLLOW the procedure and design the visual materials so that they meet the visual material design standards.

Tasks. DIT Output is indicated by the following tasks:

Draws rough sketches	To design visuals for training
Selects slide	To arrange in logical sequence
Analyzes script	To identify response frames
Listens to tape	To identify appropriate slides
Chooses color and size	To select lettering

Skills. The following Functional Skills and General Educational Development are required for performing these tasks.

Functional Skills are Data Significant, required at this level:
DATA ANALYZING -- examines or evaluates data with reference to criteria standards, and/or requirements of a particular discipline, art, craft, or technique to determine interactive effects (consequences) and to consider alternatives.

General Educational Development is required at the following levels:

REASONING -- have knowledge of a field of study having immediate applicability to the affairs of the world; define problems, collect data, establish facts, and draw conclusions; interpret an extensive variety of technical material in books, etc.; deal with some abstract, but mostly concrete variables.

LANGUAGE DEVELOPMENT -- write routine business correspondence; interview job applicants to match work and abilities; understand technical manuals and verbal instructions, as well as drawings and specifications, associated with a craft.

Design Outcomes a grouping 4.14 -- Revision of Design

Unit Objective 4.14 -- Given a set of designed materials, and evaluation data, the learner will (1) select/synthesize, and (2) follow, procedures to revise the design of the materials, according to (3) selected/synthesized standard criteria for design revision.

Behavioral Objectives and Task/Content/Skill Data for Training

4.14.01 -- Given a standard for design revision, and several sample revised designs--some of which meet the standard and some of which do not--the learner will demonstrate an UNDERSTANDING OF THE STANDARD by correctly identifying which sample design revisions meet the standard for 90 per cent of the samples. (Repeat for each standard.)

Content. DIT Input should be the standards for design revision--e.g., cost-effectiveness of revision, which negative evaluations can be translated into revisions, degree to improvement, etc.

4.14.02 -- Given a specific set of design materials, the learner will SELECT/synthesize the appropriate design-revision-standards (design and revision standards) to apply to revising the design of the materials.

Skill. Required responsibility level: with the output specified, the learner uses theory to understand, and select among and/or synthesize, the inputs, tools and equipment, standards, and procedures necessary for performing the task; he may perform the work himself, or he may set up standards and procedures for others. The learner must be able to decide, for example, whether cost-effectiveness concerns are applicable, for example, whether cost-effectiveness concerns are applicable, how to use evaluations, the degree of improvement to be required, etc.

4.14.03 -- Given a procedure for applying the design and revision standards to the revision of specific designed materials, and several sample procedures--some of which are good and bad examples of the procedure and some of which are not--the learner will demonstrate an UNDERSTANDING OF THE PROCEDURE by correctly identifying the good examples of the procedure for 90 per cent of the samples. (Repeat for each procedure.)

Content. DIT Input should be procedures for revising designed material--e.g., translating evaluation data, re-analyzing problem, rethinking sequence, materials, and approach, etc.

4.14.04 -- Given a specific designed material and evaluation data, and design and revision standards, the learner will SELECT/synthesize the appropriate procedure for applying the design and revision standards to the design revision.

Skill. Required responsibility level: (see 4.14.02.) The learner must be able to use the data to decide the degree of revision needed and how to go about doing it.

4.14.05 -- Given a specific set of designed materials and evaluation data, design and revision standards, and a procedure(s) for applying the design and revision standards to the revision of the design of the materials, the learner will FOLLOW the procedure and revise the design of the materials, so that it meets the design and revision standards.

Tasks. DIT Output is indicated by the following tasks:

Analyzes evaluation sheets............	To assess student reaction
Translates suggestions................	To make revisions
Revises draft of program..............	To reduce step size
Revises instructional materials.......	To improve quality

Skills. The following Functional Skills and General Educational Development are required for performing these tasks.

Functional Skill are Data significant, required at this level:

DATA ANALYZING -- examines or evaluates data with reference to criteria standards, and/or requirements of a particular discipline, art, craft, or technique to determine interactive effects (consequences) and to consider alternatives.

General Educational Development is required at the following levels:

REASONING -- have knowledge of a field of study having immediate applicability to the affairs of the world; define problems, collect data, establish facts, and draw conclusions; interpret an extensive variety of technical material in books, etc.; deal with some abstract, but mostly concrete, variables.

LANGUAGE DEVELOPMENT -- report, write, or edit articles for magazines which, while popular, are of a highly literate nature; write instructions and specifications concerning proper use of machinery.

PROJECT 6

CONFERENCE ON EVALUATION MODEL

PROJECT PERIOD
July 1, 1971 - June 30, 1972

PROJECT INVESTIGATOR
W. Wheeler

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EDUCATION AND
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USOE Contract No.: OEC-0-71-1253
EDUTEK, Inc.

266/267

PROJECT #6

ANNUAL REPORT

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I. Purpose:

At the present time there is no generally accepted method or procedure for assessing the relevance and effectiveness (and evaluation against reasonable criterion) of the wide diversity of education and training programs in the vocation-technical field. As demands increase for specifically qualified personnel, the mandate for effective evaluation and management guidelines of existing and emerging training areas becomes paramount.

Education and training have been implementing a systems approach to training at an exponential rate for the past decade. Behavioral objectives and individualized instruction have emerged as major instructional procedures concurrent with systems analysis.

The emergence of vocational and technical education from "the building out back" is an indication of a major shift in the thinking and attitude of educational planners and the general public toward these areas. This change is due, in part, to the tightened economy of the past few years and the resulting stringent labor market. These changes are reflected in the proliferation of area vocational schools, community colleges, and technical colleges, and in the increased activity in adult and continuing education. Exponential increases in enrollment in the technical and vocational education continuum are occurring in many parts of the country.

Sophisticated testing techniques and information feedback for curricular modification are coming into extensive use within the educational network. Information clearing houses and centralized curricular development locations are having a major impact on educational planning and implementation of new curricula.

Internal evaluation of training procedures provides some assurance of quality curricula. However, if the individual is not effectively prepared to enter the labor market and is not capable of performing at an acceptable level, even the best-managed curricula does not do the individual or society justice.

Industries have various methods of assuring quality products. Quality control during all phases of manufacturing is an accepted practice by all sections of business and industry. Failure mode analysis is utilized extensively to improve product reliability; warranty guarantees and feedback information so generated provide additional information external to the manufacturing process. Public agencies and concerned individuals exercise a watchdog function to protect the consumer and assure safety and usability.

Education has numerous accrediting agencies for institutions and programs, most of which require either testing or placement validation of the students. There is a need to follow up graduates to ascertain that they are actively employed in the area for which they were trained. Therefore, the apparent logical step for education would be to develop feedback procedures similar to business and industry to improve the usability and reliability of their product, i.e., the graduate.

A review of past activity reveals a paucity of work. The work by Rosenfeld is noted with interest. The concept of employer and employee evaluation after entry into the labor market should provide meaningful feedback information (15, n.p.). There is an abundance of materials relating to internal evaluation of educational and training systems but a dearth of material relating to external evaluation and feedback.

Educational change is typified by many studies and pilot projects that are under way or have been completed.

In The Systems Approach: An Emerging Behavioral Model for Career Guidance, Robert Campbell, et. al., state:

> "If education is to meet the demands of its time, it must plan for change. Unplanned random and reactive change, such as used to avoid total collapse of the system, although necessary for survival, creates undue pressures on the educational system, eventually reducing lines of communication between the educator and those being educated, creating major areas of distrust. The overriding quest then must be for education to discover a means of utilizing innovative intelligence in such a way as to insure a basis for the continuous process of orderly change and social renewal." (2, p. 74)

The results of a study were presented in Self Appraisal of Vocational-Technical Education in Mississippi by Local School Committees and Instructors by Arthur Jones, in which a committee of lay people and instructors were each questioned regarding various items, including follow-up. The three items determined as being the least effectively accomplished are: 1) follow-up data being used in improving instructional programs; 2) follow-up data being used in revising vocational education programs; and 3) interviews of employers being included in follow-up of graduates to determine how well they are doing. (7, n.p.)

Recommendation 18 of The Role of Secondary Schools in Preparing Youth for Employment states:

> "Evaluation of the effectiveness of vocational education should be conducted in a more systematic manner. More comprehensive data should be gathered in follow-up surveys to provide feedback to modify current programs." (8, n.p.)

The need for a modern, defensible and universally accepted evaluation system is recognized by both educational institutions and employers. A basic part of the 1963 Vocational Act and its 1968 amendments require evaluations be done to measure the outcomes of programs.

In The Role of Evaluation in Decision-Making Processes, Coster and Morgan "...emphasize the contribution that well designed evaluations can make to sound educational decision making which affects program planning and program improvement..." (3, preface).

Publications indicate a myriad of studies addressing the need for such a tool or system. None has been developed that has been deemed capable of fulfilling the current needs.

In Research, Planning and Evaluation 1968 to 1971, William Fraizer, RCU Director, notes the lack of instruments for evaluation of the level of occupational preparation (5, n.p.).

An evaluation device should be applied to the following factors:

a. the skill level obtained
b. skill growth
c. adequacy of skill taught to job requirements
d. the probable productivity of the product (student)
e. the level of favorable attitudes for employment
f. the social or compatibility level of the student
g. the correlation between job requirements/skill training
h. the correlation between skill level and hiring in requirements
i. correlation between industries' needs and school curriculum
j. adjustments in curriculum to meet:
    1. job skill change requirements
    2. social attitude requirements

These elements and others must be integrated into effective evaluation models. There is no doubt that in order to have a valid, universally accepted and usable model, close perimeters must be delineated. These might come from a "master" model with adaptations for various skill area measurements or from a series of models within the framework of a single core.

There may well be a four-prong approach to data-gathering for the model or system developed:

a. evaluation of the educational institution
b. evaluation of the product (student)
c. evaluation by the employer
d. evaluation by an independent board of advisors

In a very real sense there is a need to replace opinion with knowledge. Decision-making must be accurate, current and positive. It must be geared to the needs of the student, the employer, and to society. Only accurate information, carefully and uniformly gathered and expertly interpreted, can accomplish the objectives of vocational-technical education. A systematic approach and system analysis are essential for evaluation development. The activities related to this project should make a positive contribution to the accomplishment of this development.

II. Objectives:

The specific objectives of the project were to:

1. Establish a preliminary evaluation model to be used as a planning base for subsequent activities.
2. Identify what representative employers of technologically trained personnel perceive as deficiencies in the performance of new and existing employees at
    a. immediate post high school levels, and
    b. immediate post technical and community college levels.
3. Project competencies required by "technological employees" by 1980.

III. Methodology:

A conference designed to gain information related to completion of the objectives was held in Lincoln, Nebraska, May 17-18, 1972. Forty business, industrial and educational leaders from HEW Region VII covering the states of Iowa, Kansas, Missouri, and Nebraska, were invited to attend. Representatives were chosen from area vocational schools, community colleges, technical institutes, state departments of education, state departments of labor, and state vocational advisory boards. Business and industrial representatives were selected by the educational representatives. A complete list of participants is attached as Appendix A.

The conference staff established a conceptual model (see Appendix B) of process and product evaluation based on the work of Dr. Franklin L. King, University of Missouri-Columbia. It is generally accepted that some form of systematic process evaluation occurs in the majority of technical and vocational schools. Process evaluation is a necessary and valuable tool for the administration of educational programs but it is a tool by educators, for educators and with educators. Product evaluation has not been considered an educational tool except in the broad sense of follow-up studies caused by accrediting agencies, advisory boards and the counseling services of progressive training institutions.

Product evaluation, as conceptualized by the conference staff, occurs after the output (student-product) leaves the institution and enters employment. The prime purpose of the product evaluation is to feed information back to the process cycle for process correction. It was further conceptualized (see Appendix C) that the product evaluation must have at least two major components:

a. the employer component
b. the employee (product) component

Both components would focus on the applicability and quality of training received in relation to the employment of the product.

The model was introduced to the participants through a slide-tape presentation. A copy of the script of that program is included as Appendix D.

Small group discussion followed the presentation of the model as outlined in the agenda (see Appendix E). Each small work group was composed of a balanced mix of state and local educational leaders, and business group leaders. Each group was instructed to follow the conference agenda as published. Tape recordings were made of each group for review by the staff and to assist in the conference write-up.

Participants were asked to make necessary modifications related to the model design and applicability. These suggested modifications were reviewed by the project staff.

IV. Project Outcomes:

The business and industry representation placed an early and strong emphasis on the attitudinal problems of the workers. This emphasis caused the only major deviation from the conference agenda. As a result of the questioning by business and industry it was concluded that any product evaluation model must be able to point out norms which apply specifically to attitudes and social skills. This point was supported by notations from the small group sessions. These are included as Appendices F, G, H, and I. The general agreement was reached that both the employer and employee should evaluate these norms as well as the technical and vocational norms.

The primary function of the project was to produce a model for the evaluation of the product of technical and vocational education. This model, as modified by the conference participants, is contained in Appendix J. It is recognized by the staff and participants that this is an initial model and will undoubtedly undergo additional modification as experience is gained in the application of the model to actual situations.

An additional purpose of the project was to "project competencies required of technological employees by 1980". The projection contained in the individual group reports are generalized as follows:

a. A decreasing requirement for non-skilled and semi-skilled employees.
b. Computer hardware and software will continue to consume an increasing proportion of technological graduates.
c. Environmental-related fields will emerge as a major user of technological graduates.

These projections are based on experiences and "feel" rather than on hard data. It is anticipated that application of the evaluation model to a broad spectrum of the HEW Region VII area, with data analysis of the results will detect for educational modification purposes, employment shifts far earlier than is currently possible.

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APPENDIX A

CONFERENCE TO DEVELOP AN EVALUATION MODEL FOR EXISTING AND FUTURE VOCATIONAL EDUCATION

May 17-18, 1972
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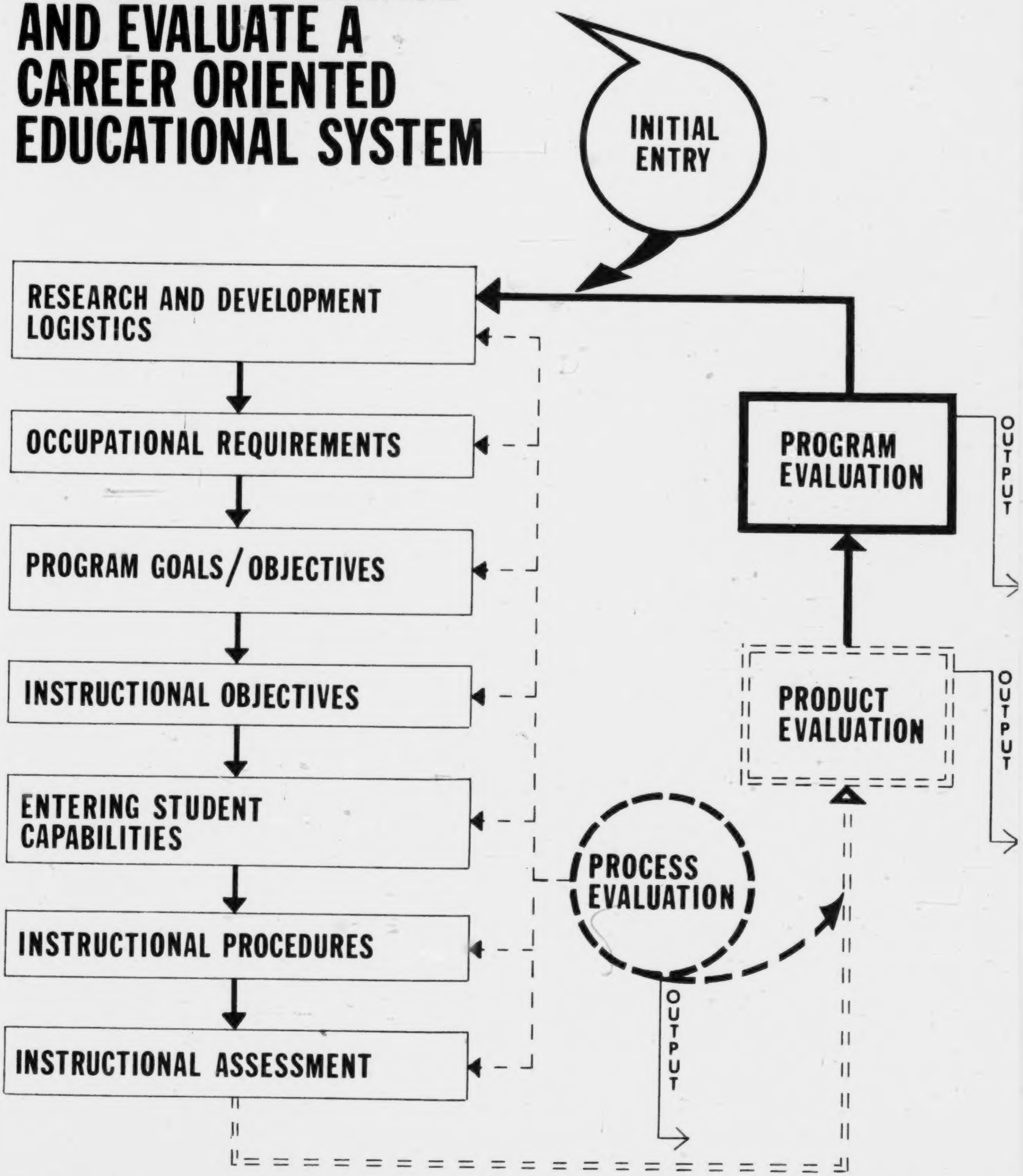
APPENDIX B

A MODEL TO MANAGE AND EVALUATE A CAREER ORIENTED EDUCATIONAL SYSTEM


INITIAL ENTRY
RESEARCH AND DEVELOPMENT LOGISTICS
OCCUPATIONAL REQUIREMENTS
PROGRAM GOALS/OBJECTIVES
INSTRUCTIONAL OBJECTIVES
ENTERING STUDENT CAPABILITIES
INSTRUCTIONAL PROCEDURES
INSTRUCTIONAL ASSESSMENT
PROGRAM EVALUATION
OUTPUT
PRODUCT EVALUATION
OUTPUT
PROCESS EVALUATION
OUTPUT

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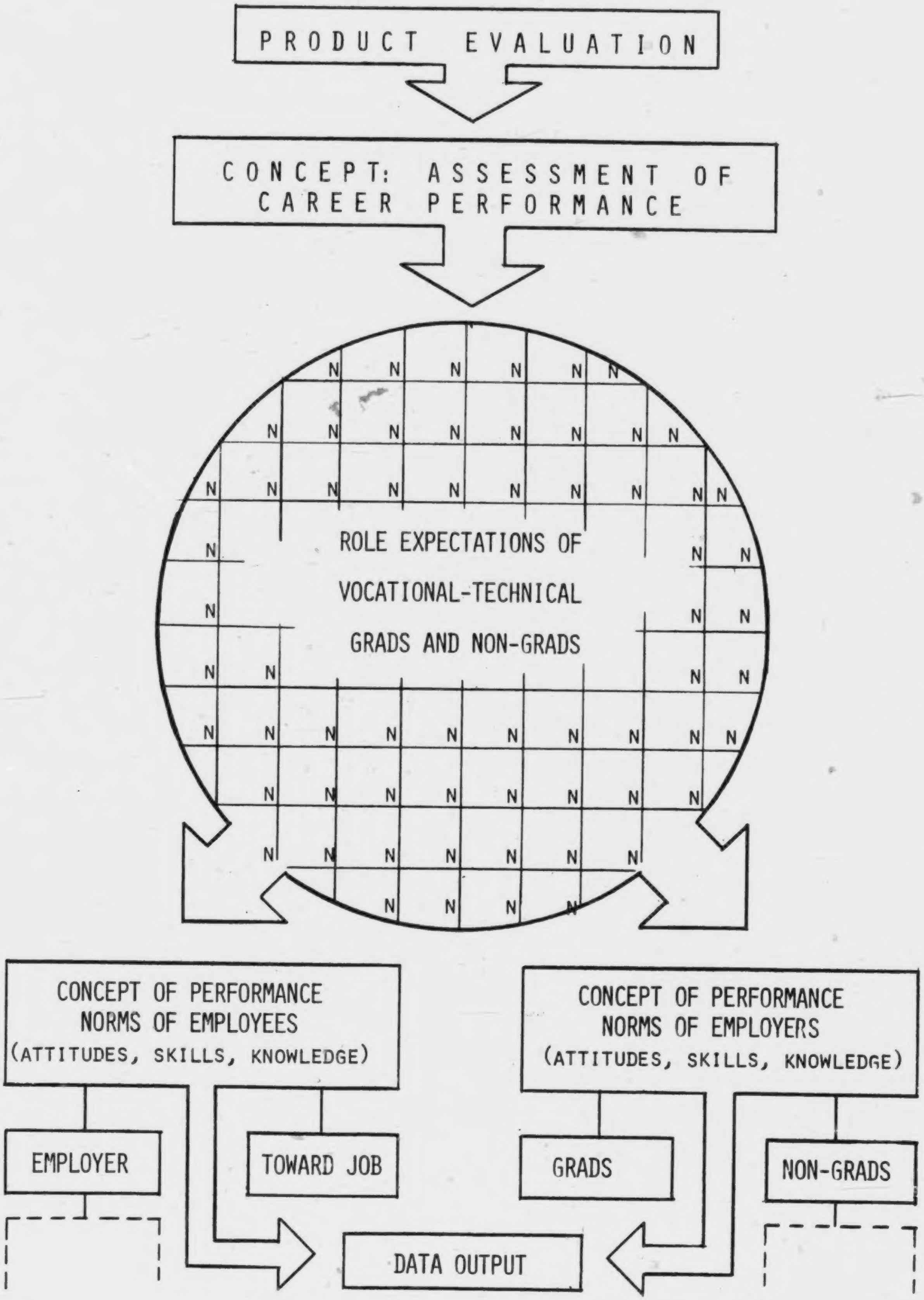
APPENDIX C


PRODUCT EVALUATION
CONCEPT: ASSESSMENT OF CAREER PERFORMANCE
ROLE EXPECTATIONS OF VOCATIONAL-TECHNICAL GRADS AND NON-GRADS
N
CONCEPT OF PERFORMANCE NORMS OF EMPLOYEES (ATTITUDES, SKILLS, KNOWLEDGE)
CONCEPT OF PERFORMANCE NORMS OF EMPLOYERS (ATTITUDES, SKILLS, KNOWLEDGE)
EMPLOYER
TOWARD JOB
GRADS
NON-GRADS
DATA OUTPUT

APPENDIX D

SCRIPT FOR SLIDE PRESENTATION

"A MODEL TO MANAGE AND EVALUATE A CAREER-ORIENTED EDUCATIONAL SYSTEM"

Slide #1	"A Model to Manage and Evaluate A Career-Oriented Educational System."
Slide #2	Written by: Franklin J. King Illustrations by: Jerry Joyner Your narrator is: Merlyn Herrick
Slide #3	History records man has used various tools and specialized equipment to increase his capabilities to secure food, clothing, shelter.......and his women. As long as the tools remained simple, man had control, because he furnished the power to drive the tools.
Slide #4	However, as outside power sources were added, the equipment became more complex, and not in man's sole control. At this point, men and equipment became joint components in accomplishing a given task or sets of tasks. For this arrangement to function in the most efficient manner, a system had to be devised. Thus, these joint components, men and equipment, formed a new concept, a "systems concept".
Slide #5	Education has followed a similar pattern. Once education was simple -- (read deliberately) a man, a log, and a willing student.
Slide #6	Education is now a complex system, a prerequisite to getting a job. We must be able to manage and evaluate this educational system and make improvements. The model we want to present at this time is designed to accomplish this management and evaluation objective.

Slide #7	Each blank space you see projected on the screen represents a component part of the model. Notice that the components are linked together. The lines and arrows denote the provisions for feed-back. This provides a continual process whereby we can literally feed back information to each component part and make decisions whether or not our system is accomplishing its purpose or mission. With that in mind, let's start developing our model.
Slide #8	First of all we have indicated "initial entry". Obviously, you cannot evaluate until a process or a part of it has been completed, so we have made provisions here simply for the initial entry.
Slide #9	Next in the model is "research and development logistics". You have a definition of terms used in this model and we will also have a chance to come back and analyze this component using that information just as we will each of the other components in turn.
Slide #10	The next component is "occupational requirements". We will come back and analyze the two facets of this component.
Slide #11	The component listed next in our development is "program goals and objectives". These serve as our guides and they also serve as the baseline for our evaluation.
Slide #12	Continuing on, we project "instructional objectives". These not only serve as the basis for our classroom instruction but also as the basis for the evaluation of the instructional process.
Slide #13	"Entering-Student Capabilities". If there is a weakness in our total educational system, it is probably at this level. We shall discuss that further when we return to this particular component.

Slide #14	The next component is "instructional procedures". This component is teacher-centered. In evaluating this component, we ask questions regarding -- what are our instructional procedures?
Slide #15	We now project "instructional assessment" and we have defined assessment as evaluate or appraise. Now that we have these components linked together, how can they help us accomplish a mission.
Slide #16	The first mission or task we can now accomplish is a "process-type evaluation". This gives us the capabilities of continuous evaluation while the instruction is in progress. Notice the single line that feeds into or out of the components of the system.
Slide #17	The second mission or task that can now be accomplished is noted by the component "product evaluation". The educational product is the student and we need to obtain information regarding the field performance of our former students from each instructional area. Notice that we are progressing along the lines that are indicated by the directional arrows. This gives an indication that some of the data needed for a product evaluation may be obtained from a process evaluation effort.
Slide #18	The final component to complete our model is "program evaluation". At this level we are studying the contributions of each vocational-technical offering in relation to our total program effort plus other management functions. You should note that program evaluation provides feedback information into the total system. Because of this relationship we will now briefly analyze each component in the model as we promised earlier.

Slide #19

"Research and Development Logistics". From the definition of logistics, we are talking about materials, personnel, and economic considerations. We have listed four parts of this component:

1. "Literature Review" -- this simply means to find out what has already been written about the program that you wish to improve or that you wish to initiate.
2. "Instructional Resources" -- What are the instructional resources necessary for the operation of this particular program?
3. What are the "personnel" requirements?
4. What "facilities" are needed?

You may add to this list such things as community occupational surveys, labor market surveys, U. S. census data, cost analysis information, tax base information, transportation and utilities.

Slide #20

"Occupational Requirements". We have listed four examples that may be used to analyze this component, the first of which is "surveys". All of the survey data revealed by the research and development component just discussed may be used here also. Added to surveys are "job description", a "job analysis", and "occupational analysis". You should notice that occupational requirements has a two-fold meaning. First of all, we are talking about the availability of jobs in the work force and secondly, we are talking about the requirements of each job. To continue the analysis beyond these four items, we may include Dictionary of Occupational Titles, Occupational Outlook Handbook, census data, Career Brochures, Want Ads, Union Apprentice Standards personnel placement data, and advisory committee data.

Slide #21

"Program Goals and Objectives". These objectives may be "area vocational-technical school objectives", they may be the objectives of the "vocational department in a comprehensive high school", they may be the objectives of a junior college department of technical education, or as a concluding example, they may be objectives of a technical institute. Program goals and objectives are a major part of this model, because without objectives, we would have nothing upon which to base an evaluation.

Slide #22

"Instructional Objectives". We have divided "instructional objectives" into two categories: "course objectives" and "lesson objectives". Instructional objectives are those things we expect to attain during and at the conclusion of the instructional process.

Slide #23

"Entering-Student Capabilities". If you were asking questions about what constitutes entering-student capabilities, you would list such things as "previous experience", "interest", "attitude" and "aptitude". We must continue this list until we have the information needed to give a complete profile to measure entering-student capabilities. It is vital to have these measures in order to evaluate the results of instructions. Otherwise, the system fails at this component.

Slide #24

"Instructional Procedures". When we talk about instructional procedures, we are talking about what happens in the classroom. We have listed four things. What teaching "strategies" are used, what "methods"? Are there provisions for "teacher-student interaction", "student-student interaction" -- you may complete the list by naming other procedures.

Slide #25

"Instructional Assessment". We have listed two things: the "behavior change" that has taken place presumably because of classroom instruction, and the "competence level" the student has attained according to the final measurement upon completion of the instructional process.

Slide #26

"Process evaluation" illustrates that evaluation of the instructional process has input or feedback features to all of the components even through the information for process evaluation is obtained primarily by evaluation of the instructional objectives, entering-student capabilities, instructional procedures, and instructional assessments. Even though these are the four primary components that you would be evaluating in your process evaluation, you can also see that the data obtained has feedback features back to program goals and objectives, back to the occupational requirements, and back to the research and development logistics. Also note that there is a major spin-off for data to feed into the other components which recycle through research and development logistics. You may also report out process data at this point, such as assignment of grades.

Slide #27

Recall that the "product evaluation" is related to career performance. We are interested at this point in finding out what the student has been doing since terminating his schooling. The student is the product of our instructional process, thus product evaluation. The information obtained during the instructional process may be used for comparison with the data obtained from a product-type evaluation.

Slide #28

The scope of a "program evaluation" is always in terms of the objectives set for that particular program evaluation project. In the context in which we are using it, a program evaluation may include all of the vocational offerings in the school system, it may include all of the vocational offerings as well as the academic offerings, or a selected sample thereof. Now please note, that a program evaluation or, for that matter, any other type of evaluation, is always directed by the objectives you wish to attain for a specific evaluation procedure. This leads us to the primary purposes and objectives of this conference.

Slide #29	We need your input regarding product evaluation. We are asking your help in developing a model which will permit us to explore, in depth, the student -- product of our vocational-technical programs.
Slide #30	The preliminary design of our model on "product evaluation" looks like this in skeleton form. We will explain each part.
Slide #31	The underlying concept of product evaluation is the "assessment of career performance" of graduates and non-graduates of our vocational-technical programs. What roles have they assumed in society since leaving the formal classroom? The roles that our vocational-technical graduates and non-graduates are playing in the world of work are of utmost concern.
Slide #32	Roles are divided into many parts depending upon their complexity. We have symbolized this by dividing our role symbol with grid lines. You probably first learned about the division of roles as a child in the games you played. If you played baseball, you not only had to learn the role appropriate to your position, but you had to learn the expectations of all the members of the team to your role and to each other's role.
Slide #33	When we examine the roles in the occupational world, we find that built into each role is a system of rewards for those who play the role and non-rewards for those who fail. We have labeled the built-in role expectations as norms or N. For example, the role of a machinist might include such things as: be at work at 8 a.m., turn cylinders to plus or minus five thousandths tolerance within a time standard. We then continue our analysis until all of the norms connected with this particular machinist's role are identified. The machinist is rewarded according to the way he plays the role.

Slide #34	This raises the question -- What norms do we expect in the occupational role played by graduates and non-graduates of our vocational-technical programs? Do we expect only half as much from our program dropouts or non-graduates?
Slide #35	Do we expect total norm performance from graduates of our vocational-technical programs? Has industry provided for a reward system based on entering competencies when graduates are compared with workers hired without special training? Identifying the norms of performance is crucial to both the worker and the employer. Thus the problem of assessing career performance is multifacted but it primarily centers around the expectations of the employee and the employer.
Slide #36	What ideal performance norms should the employee exhibit based on skills, knowledge, and attitudes? For example, what attitudes should he have toward his job, his employer, and toward the training received? What skill levels? What should his role expectations be? We want you to help us develop this model by identifying the ideal performance from the viewpoint of an employee.
Slide #37	On the other side of the coin, what are the ideal concepts of performance norms which should be exhibited according to the employer? For example, what performance norms are assigned to graduates of a vocational-technical program? What are they for non-graduates? Does the role expectations for vocational-technical school graduates have built-in rewards for performance? We want you to help us develop this model by identifying the ideal performance of an employee from the viewpoint of an employer.

Slide #38	Our challenge to you is to help us develop this product evaluation model in order that we may assess the career performance of any vocational-technical school graduate or non-graduate according to role expectations. By identifying the performance norms based on skills, knowledge, and attitudes from the viewpoint of both the employee and the employer, we can develop instruments to gather data to see how the present performances of our graduates and non-graduates meet the standards set for them. With this type of high quality data, program changes in our vocational-technical schools can be made relevant to both the employee and the employer.
Slide #39	"Let's Interact."

APPENDIX E

CONFERENCE TO DEVELOP AN EVALUATION MODEL FOR EXISTING AND FUTURE VOCATIONAL EDUCATION

May 17-18, 1972
Lincoln, Nebraska
AGENDA
May 17

9:00	Welcome	Bill Stucker
9:15	Conference Goals	Wayne Wheeler
9:30	Evaluation Models- Common Concepts	Frank King
9:50 - 11:45	Small Group Discussions Groups and group leaders to be designated by Wayne Wheeler Through discussions in the small groups, reactions and responses to the preliminary model prepared by the project staff will be generated and documented. The documentation may be organized under the following headings: A. Content B. Administration C. Applicability D. Feedback Information E. Evaluation F. Other	
11:45 - 1:00	Lunch	
1:00 - 1:20	Group chairmen report small group feedback to all participants	
1:20 - 1:30	Synthesis of group reports	Wayne Wheeler

1:30 - 2:30 Small Group Discussion II

Individual group chairmen and group assignments will be made by Wayne Wheeler

Through Small Group Discussion II, recommendations will be prepared on Methods of Interfacing Development of the Model Between Education & Industry. Recommendations may be organized under the following headings:

A. Relationships between employees/employer evaluation
B. Congruence of information for feedback purposes
C. Interrelationship with state requirements
D. Interrelationship to Federal Regulations
E. Feedback Methodology
F. Other

2:30 - 2:45 Coffee

2:45 - 3:05 Group chairmen report small group feedback to all participants

3:05 - 3:15 Synthesis of group reports Wayne Wheeler

3:15 - 4:15 Model Modification

4:15 - 5:00 Industry and business training deficiencies

5:00 Adjournment

May 18

9:00 - 9:45	Small group discussions projecting competencies required of technological employees by 1980 Group leaders and group assignments will be made by Wayne Wheeler
9:45 - 10:15	Group chairmen report small group feedback to all participants
10:15 - 10:30	Synthesis of group reports
10:30 - 10:45	Coffee
10:45 - 11:15	Summary of Evaluation Model as reviewed and modified by conference participants Wayne Wheeler
11:15 - 12:00	Conference Review
12:00	Lunch and Wrap-up

APPENDIX F

NOTATIONS FROM
CONFERENCE GROUP I

Group Leader: Dr. John Elias

Group Participants:

Donald Andrews
William Bachmann
Richard Bringelson
Dixie Kohn
Wayne Schroeder
Thane D. McCormick
Robert Schleiger
Robert Filbeck

SESSION I

SUMMARY

Definition of Product:

-- The group one participants attacked the problem of creating a working definition of the product of vocational education institutions. The definition of product was: a student competent and reasonably contented in his occupational preparation. It was agreed that this was another way of stating that the student's role expectation and the role expectation of his employer had a reasonable correlation. This definition was broken down into the following components:

1) Social skills

2) Job skills

3) Fundamental educational skills

4) Adaptability to change

5) Life style off the job when it affects performance on the job

6) Social responsibility

-- It was agreed that these components could and should be further divided into specific performance statements. Norms could then be determined for the performance statements. These norms would represent the parameters of acceptable behavior within which the students' performance would have to conform. However, it was agreed that the educational institutions must train on broad norms and leave it to industry to train for specific needs.

SESSION 2

SUMMARY

Institutions' Responsibility and Accountability:

-- Considerable discussion was devoted to the time span of the institution's responsibility and the duration of its accountability. It was the consensus that all must recognize that education is only one of the influences on an individual. As a result, the influence of the institution must be carefully assessed in order neither to understate nor overstate its influence.

-- It was suggested that since there are many barriers to change in education, a means of pressuring for change should be built into the evaluation model.

SESSION 3

SUMMARY

-- The group began by discussing the entire evaluation model. It was unanimously agreed that the model was workable and was accepted by the group.

-- It was decided that three groups should provide the data input for evaluation - students, employers, and the institution. The student (employee) and the employer evaluations should be independent with feedback to the institution. A major problem identified was the lack of a defined methodology which could be used to gather data from the employers. The businessmen in the group emphatically stated that employers would tolerate very little data gathering.

-- The data gathered from the different populations must be congruent, The information gathered must be compatible in order for it to be related and interpreted with the data from the other population groups.

-- The group agreed that any evaluation system must take into consideration data gathering and evaluation efforts of state and federal governments. The evaluation system should be compatible with the regulations and requirements of these agencies whenever possible. In addition, the evaluation system should utilize data gathered by and for these agencies. Every effort should be made to refrain from the duplication of data gathering.

-- It was felt that at least a considerable portion of the evaluation should be quantifiable and should probably be computerized as applied to the norms illustrated in the model.

-- The point was made that all too often educators prepare their reports forother educators and forget that their consumers have neither the time nor interest to read or listen to such details.

SESSION 4

SUMMARY

-- The lack of research available for review prior to development of the evaluation model illustrates how little attention educators have paid to systematic product evaluation.

-- Since the group had accepted the overall evaluation model, discussion was directed toward the role expectation model. Considerable discussion was devoted to the advisability of adding another major component to the model. This component would be to provide for input from society. Provision should be made to determine the ways in which society evaluate education and its products. It was not decided if this should be a separate component or if it should be included as a part of the research and development logistics element in the overall model. Methods suggested to measure society's evaluation input were:

1. Professionally conducted samples similar to Roper and Nielsen polls to periodically measure public reaction

2. Ad Hoc Committees

3. State Advisory Councils

4. Public relations specialists

-- The group discussed the parameters of the role expectations. It was agreed that the role should include more than just the role on the job. It should also include that portion of the total life style which affects performance in the occupation. This would not basically affect the model except to increase the quantity of norms being measured.

-- The suggestion was made that instead of labeling the one element "graduates and non-graduates", it should be program completion, partial completions, and non participants.

-- There should be recognition in the model of the federal/state control and interference.

SESSION 5

SUMMARY

During this session the group reacted to the following statements:

1. Technical skills will attain the job but social attitudes will retain the job.

2. Technical training is over-emphasized over the social and attitude aspects.

3. We should insert the evaluation of the social and attitude aspects but not at the expense of the technical aspects of the job.

4. Attitudes are easier to deal with than programmatic and technical problems.

-- There is no scale or level of social skill required for initial employment. The degree of social skill required will vary with the particular job. Positions that require more interpersonal interaction require greater skill. Specific skills required for the job are the most important factors in the initial hiring. The weights or percent of skill/attitude varies according to the occupation and also upon the person hiring. In the final analysis both can be critical.

-- While the model can be utilized for all occupations, the basic ingredients that comprise the different norms will differ as well as the weights applied to them. There will be many areas where social skills weigh heavier than in other areas.

-- The instructor who has had occupational experience usually will emphasize the necessity of social skills. However, while the teaching of skills is purposeful and planned, the teaching of social skills is probably more often than not left to chance.

-- It is extremely difficult to modify attitudes of people when they have reached high school or past high school age and even more difficult vocational education has a responsibility to teach social skills and modify negative attitudes.

-- Evaluation of social factors should be inserted but not at the expense of technical aspects of the job.

-- Attitudes and social skills represented a common base for all participants to discuss. Since these are common to one extent or another to all occupations they are able to be discussed in general terms. If the attitudes of personnel or their social skills affect the job or the organization then there should be some conformity by the personnel. There are norms within which the employee must conform.

SESSION 6

SUMMARY

-- During this session competencies required of technological employees by 1980 were projected.

-- Workers must become increasingly more flexible and versatile. They must be able to keep abreast of changes and trends. They must be able to accept and adapt to constant change. They must be receptive to a retooling period every four or five years and even to changing from one career to another.

-- The shorter work week and early retirement have great potential for impact on vocational education. Vocational educators may be forced to recognize and even promote collateral education, in-service orientation, and productive use of leisure time.

-- The development of participatory management with the total work group involved in making decisions will affect the training programs of these workers.

-- Vocational educators must continually look at the criteria which determine the work experiences required for vocational instructors.

APPENDIX G

NOTATIONS FROM

CONFERENCE GROUP II

Group Leader: Franklin J. King

Group Participants:

James Lightbody
Thomas Creech
Donald Welsh
George N. Lawry
Charles A. Cromer
Harlan Heald
Dick Baker
Dale Zikmund

SESSION I

SUMMARY

At the outset of the session, the group decided to look at the concept of the evaluation model in terms of the employers' role expectations. In order to start the discussions, company representatives of the group asked to center the discussions on the attitude aspects of the proposed model.

I. Attitude Items

Employers expect to evaluate employees two or three times per year in the following categories:

1. Teamwork - How does the employee relate to the total company role?
2. Aggressiveness (constructive)
   - a. Identify standards of attitudes.
   - b. Note conflict between stereotyped expectations of employers and new attitudes of employees.
   - c. Identify how much individualism can be allowed in molding together a working group.
3. Acceptance of goals of company dedication.
   - a. Advancement (hospitals have built in barriers to advancement because of license requirements.)
   - b. Productivity is linked with employer expectations.
   - c. Employer's expectations are conditioned by company goals and personal objectives of heads of firm.
   - d. Safety factors of production and abuse of sick leave are attitude indicators which can be observed and measured by employer expectation standards.
   - e. Job economics connected with employer goals are expectations.

II. Development Procedures

1. Survey to discover common expectations.

2. Evaluate survey with follow-up interviews.

3. Survey responses to be based on ideal expectations.

4. Expectations to be in rank order.

5. Identify essential expectations.

6. Sources of expectation information:

   a. Immediate supervisor's expectations

   b. Check firm records and policies

   c. Production and other divisional coordinators

   d. Older employees

III. Questions to Guide Evaluation Model Development

1. Do schools evaluate?

2. Who from school should evaluate?

3. Would employer cooperate in evaluative efforts?

4. Does personnel management have different outlook than production management? (Business representatives indicated that production set many role expectations rather than personnel management.)

5. What is the effectiveness of advisory committees on the input into evaluation? (Advisory council can be more effective if specifically directed.)

6. Should educators inform employer of known deficiencies of their graduates? (Employer representatives stated that a real problem exists in that people are not being evaluated before they go on the job.)

7. Who should set the responsibility for evaluation?

IV. General Evaluation Items

1. Employee should be informed of employer's expectations.

2. Need a dual commitment on evaluation between school and industry.

3. Need feed-back information and must orient both students and employers of the necessity for feedback.

4. Accurate information may be obtained by going directly to the source.

5. Institutions may not be honest in their evaluation, therefore, there is a need for a third party outside of the instructor and coordinator to report evaluation data.

6. Schools are not completely honest in reporting less-than-standard qualifications.

7. Schools may be concerned with numbers and a service with little regard to the products they turn out.

8. Identify what is to be observed and measured, then let evaluation form the basis to establish a communication system between the consumer of the educational products and the educational institution.

9. Industry is going to look more critically at its most costly resource - labor.

10. Need to set proficiency standards for on-the-job performance.

11. Need two-way communication on skill assessment.

12. Need trained management in evaluation efforts.

13. Research data from this evaluation effort should be utilized to screen all applicants for positions.

SESSION 2

SUMMARY

A follow-up of Session 1 brought out the following points for discussion to be considered in the development of the evaluation model:

1. Investigate the formal structure of business expectations.

2. Investigate the informal structure of business expectations.

3. Follow-up data not presently being plowed back into program change.

4. Private schools - What is training life (5 - 10 years later)? Compare this to public schools.

5. Hospitals and nursing schools not in full communication. This should be considered in developing model.

6. Who should administer instruments on follow-up?

7. Personnel office will not respond in the same context as we are talking. May need to involve total management in evaluation efforts.

8. Advisory committee? Can be made to work.

9. Joint responsibility needed as indicated by analogy (parent - elementary school) charges and counter-charges - where are responsibilities.

10. Industry should make demands on educational programs. Who takes initiative where we hire trained and untrained workers alike?

11. Students are not always "set" toward cooperatively working in industry.

12. Management is not the schools' strong point, so they need help.

13. Independent audit necessary.

14. You are saying to me that you want me to hire everyone you train.

    a. Should you send me students below standard?

    b. What are the standards we are talking about?

15. This survey should reveal role and student should know the results of the survey.

16. How well is student being indoctrinated to this role?

17. How to evaluate before a person goes on the job?

18. Proficiency standards start on job time-line.

19. Are managers well trained to utilize institution-trained personnel?

20. Management must "feed-back" to correlate information.

21. What is the difference between two years and three months training in rewards to employee?

22. Concept of performance contract is a feedback between employer and instructional setting.

SESSION 3

SUMMARY

The group chairman read the statement from the program. "Methods of Interfacing Development of the Model Between Education and Industry", and asked what it meant. The following points were made by the group:

1. The statement means how do we provide the vehicle for this product-type evaluation system?
2. How do we get industry to agree with what we decide?
3. How do we provide statistics?
4. What is the relationship of this evaluation effort to state and federal levels of responsibility?
5. Will we develop a uniform model for continuous feedback?
6. We must start by developing a system acceptable at the community level.
7. Are we developing a sub-system model?
8. Can industrial sources and educational sources agree on the information to be gathered?
9. Is there concerned and competent local leadership to initiate such an effort? (This also pertains to local directors of vocational-technical education and those responsible in the same areas at the State Department of Education level).

Exploration and discussion of the above items and questions resulted in a consensus of opinion that evaluation must be pursued at an early date and that the model presented had potential for doing the job and that local input must be solicited just as the group was in the process of probing all areas to be covered by the proposed evaluation model.

The next major area of discussion which the group linked together was in relation to the statement: Who should be responsible for the initial evaluation effort and what is the mandate in the State Plans for Vocational effort toward evaluation? The following points were then discussed:

1. If the State Department of Education must initiate such an evaluation effort it must be considered to do so by default. The initiation must come from local institutions, business and industry.

2. It may be probable that there will have to be a federal mandate to set the required evaluation efforts into action.

3. It is difficult for local agencies to see the concept of evaluation.

4. The development of a system of product-type evaluation must take into consideration the interests of local, state and federal agencies.

5. The educational institutions must be depended upon for leadership.

At this point the group agreed that the assessment of career performance of the graduates and nongraduates of vocational-technical programs was a local responsibility. In order for this to be accomplished the following must be considered:

1. Efforts must be oriented with industry. The model must be based upon the ideas of the industrial community.

2. The evaluation cannot remain local, it must be coordinated at a higher level.

Next in line for examination were the provisions of the State Plan for Vocational Education in regard to evaluation of local efforts as stated in the beginning of this session. The following points were expressed.

1. The state plan provides for evaluation.

2. The state plan is developed upon the theory all will evaluate but the motive of the state plan is wrong since the local institutions did not have major input upon the type and scope of evaluation efforts at the time of the drafting of the state plan. Therefore, local institutions are not serious about following the the state plan except to comply in such a fashion as to secure funds.

3. Development of the state plan must not be solely the responsibility of the State Department staff but it must be written in part by local institutional staff and thus have a commitment to its implementation.

4. We have the mechanism for this type of evaluation but as things are now organized, it is primarily a paper exercise and is not a viable means for fostering program changes and other improvements.

5. Industry will accept professionals to do the evaluation and top management will become involved and very interested.

6. Interface and decision at lowest common denominator. State is doing for us what we should do ourselves. Motivation for compliance is not the proper type of motivation for local evaluation efforts.

7. If the state plan is to be "seed" for the model, we need workshops and institutes at all levels to explain how the model will be implemented.

The final part of this session was centered on motivation. The following was discussed:

1. How do agencies get motivated?
    a. threat by state
    b. promise of funds
    c. professional attitude
2. There must be a change in attitude of local administration to become involved in evaluation efforts.
3. The community at large must be motivated to provide accurate and objective type data to close the credibility gap between business, industry, and the educational community.

SESSION 4

Topic: Modification of Model

SUMMARY

The group decided that since they basically accepted the proposed model they should explore ways to implement and offer suggestions of what to look for in an investigation aimed at model development. The following items were offered for consideration:

1. Basic Process:
    a. identify roles
    b. establish norms
    c. rank order
2. Series of surveys:
    a. Obtain items to establish norms for identified roles, using acceptable research procedures, establish a commonality index of 90-95 percent to filter out basic norms.
    b. Two-pronged approach:
        1. employer
        2. employee
3. Stratified random sample of persons employed one, two, three years as norms may vary depending on length of time a person has been employed.
4. New employees will have different norms, especially in attitudes, than older employees.
5. Norms should be previewed by older employees - this could be a sub-component in the model.

6. Rank order norms in order to make change in the educational program.

7. It is essential to establish - what norms, out of all the possible norms, are important.

8. Commonalities for any job may be more appropriate for attitude than for technical knowledge and skills.

9. The model must remain flexible to allow for changes in norms related to specific roles.

10. Managerial experience of persons responding to the norm questionnaire will most likely be based on the ideas of older employees.

11. Role expectations should be based on the job rather than on the individual.

12. Keep in mind that the most important norms to measure and identify are those associated with the role expectations of the business and industrial community.

13. Out of all of the research connected with this evaluation model, one thing should be paramount - "What does a potential employee need to know in order to be a successful employee?"

14. It was established that a graduate was one who completes a program regardless of the length of the instructional period. A non-graduate was one who has not completed the vocational-technical program in which he enrolled.

15. The final point was that the model must fit both pre-service and in-service type educational programs.

SESSION 5

SUMMARY

Group II recorded the verbal directions for discussion as follows: There may be a much as fifty - eighty - ninety percent of time and training directed toward the technical aspects of the job whereas there may be a necessity for that amount of time to be devoted to attitudes. With this as a basis, react to the following statement:

1. Technical skills will attain the job but social attitudes will retain the job.
2. Technical training is over-emphasized over the social and attitude aspects.
3. We should insert the evaluation of the social and attitude aspects but not at the expense of the technical aspects of the job.
4. Attitudes are easier to deal with than programmatic and technical problems.

Reaction to Item No. 1:

1. Disagree slightly. Some students do not attach importance to "social" skills to meet employer in order to get the job through qualified skill-wise:

    a. handy with a wrench

    b. may be able to write a decent report

    c. cannot meet interviewer

    This may not be as important for persons employed in the trades as in other areas of employment:

    a. social skills are important to keep a job, but must still have necessary technical skills. Business looks at:

        1. skills and knowledge

        2. compatability with other people

    b. Can you teach social skills? You can tell them to be sociable but what is the end result?

    c. Social skill development has been left primarily to chance on "school of hard knocks".

    d. Depends on whether or not a person works alone or within a group.

    e. Both are needed - technical skills important at entry level - achievement depends on social skills - technical skills are still necessary to retain a job.

    f. Must be a mix-one cannot be excluded.

Reaction to Item No. 2:

1. Yes, with the exception of a cooperative program.
    a. varies from school to school and from instructor to instructor.
    b. the social skill area is not normally an integral part of most vocational-technical programs.
    c. An advisory committee might tend to assist an instructor to include this area.
    d. Task analysis of a job would uncover the necessary social skills.
    e. follow-up of students would help determine necessary social skills.

Reaction to Item No. 3:

1. Yes, the evaluation of the social and attitude aspects of the job should be included but not at the expense of the technical aspects. There is a need to evaluate all three.

Reaction to Item No. 4:

1. The group discussion focused on the attitude area since this is the most difficult area to establish behavioral performance whereby objective evaluation can take place. Investigations should try to isolate and define the many variables which make up attitudes. The group felt that programmatic and technical problems can be identified and dealt with in a much easier fashion than can attitude variables.

SESSION 6

SUMMARY

During this session competencies required of technological employees by 1980 were projected.

1. The computer will continue to have an impact on many occupations.
2. Schools must work directly with business and industry to keep on top of new skills.

3. Schools must work closely with OEM (original equipment manufacturer).
4. Half-life of graduates will continue to decrease.
5. Self-management, self-motivation to learn and keep up-to-date will be essential.
6. In-service educational activities must increase.
7. Employees must develop an attitude favorable toward learning (contrasted to forced in-service by licensing agencies).
8. More specialization in technical areas (technicians).
9. Proficiency testing will be instituted in order to keep jobs.
10. Career ladders - achievement within a profession, on the job will continue at a more rapid rate.
11. Need improved instruments to measure attitudes and performance.
12. Career lattice concept - mobility within an occupational field.
13. Better articulation will be needed in educational institutions.
14. Change in an employees attitude is as important as change itself.
15. Much emphasis on retraining and upgrading (recycling).
16. Professional associations must be willing to accept change.
17. More communication with employers, unions, labor, professional organizations.
18. Community colleges, technical education, 13 & 14 years will become more acceptable.
19. Concept of career education will be explored.
20. Concept of continuing education will become more important.
21. Many liberal arts graduates not be able to find employment.

22. Career patterns will include two years at a community college - work - back to school.

23. Higher technician to professional ratio.

24. Business and industry may redefine jobs within their own industry.

25. One program of common competencies to many jobs.

26. Better job placement and preparing persons for jobs that are actually available.

27. Closer cooperation between professional organizations in order to survive.

28. Instructional curriculums will be redesigned to meet needs.

29. Student's organizations will become an important social aspect of training.

30. Short courses, institutes, seminars - better systematizeds and less left to chance will be provided by educational institutions.

31. Vocational-technical educators will need more employment experience coupled with formal educational experience.

32. Employment experience will tend to become more important than purely academic preparation.

33. More employees will come from two-year institutions.

34. Educators must spend more time planning and evaluating.

APPENDIX H

NOTATIONS FROM
CONFERENCE GROUP III

Group Leader: Robert W. Mills

Group Members:

Lloyd Mather
Robert Reier
Willis Meyer
Vernon Pickett
Donald Simmons
Virginia Vieregg
Milt Miller

SESSION I

SUMMARY

-- The general charge to the group was to consider and react to the preliminary model.

-- The object of the model is to evaluate the product. The product is the student.

-- Are institutions willing to accept accountability for their product? How much is known about the product? Should the product be asked, "Are you over- or under-trained"?

-- What are the parameters? Is vocational education viable? Is education able to change with needs or is it like cold lava?

-- In searching for criteria of product, are wages employers are willing to pay considered a barometer? (The consensus was that unless highly skilled, trained and untrained employees start at the same wage level.) Is only half as much expected from a dropout? Is full performance expected from a vocational graduate? What is the difference in performance expectations of the employee and those of the employer? If wages are the same, expectations must be the same. There is considerable variation in hiring practices regarding entering skill and starting wage.

-- Regarding the model, does it measure a student trained for one activity, who then finds himself in a totally different activity? Does the employer know or care about the expectations of the new employee? Does this contribute to the student feeling he is not prepared, no good to his employer or himself? This would have a wide impact on feedback for evaluation.

-- Can this model be used widely, especially if definite parameters are established, or does a special one need to be developed for each skill or cluster of skills? Should, or can, this model be used to evaluate or even develop career expectations? What impact results from a difference in concepts of employee and employer?

-- A very important question is when, where and how this model is to be used. Though opinions were not unanimous, most felt it would be most reliable on the first job, a few felt it could be used on the second job, and no one felt it had value thereafter in its present form. Also, there is the question of who should be interviewed in applying this model. Should it be the student, employer, line foreman, or personnel people?

-- Some felt the model could not measure a very important aspect. Several major personnel directors say class attendance was most important. This is one attitude which is probably measurable and directly reflects future absentee patterns.

-- Returning veterans, with or without vocational training, are better students. They have maturity, responsibilities, and interests.

-- Could the model be used for placement? Some skills (blueprint reading, micrometer use, etc.) will either result in higher entrance levels or faster progress. Less supervision is required. Is this already known, or is this a use for the model?

-- Would the model help sort out the best people to hire when there is a labor surplus? Do all vocational programs teach what attitudes an employee should have? Do they tell the student what is apt to be expected of him? Are general, wide-ranging vocational training, special isolated courses, or only a full two-year technical course being discussed? This is very important and needs to be determined.

-- Can the model be used to measure entry and exit of students on the job?

-- Where can a student substitute some technical training for apprentice programs? Almost no progress has been made here except in isolated cases. Maybe use of the model can give direction toward better training programs, more useful, germane new material.

-- How can a teacher be effective in preparing a student for employees' needs when he probably was never an employee of industry?

-- Feedback is a real problem. It is assumed that feedback is needed by the teaching institution. Who feeds back--employee, employer or supervisor? Which is most accurate? Some conferees suggested committees, much like union or safety committees. This could have a wide and changing membership. It would probably be objective and more accurate than individual feedback. When fed into the model, it might indicate good averages and if and when changes were needed. Some feel the only place labor and management agree is that vocational-technical programs are important but no definition was brought forward.

-- Do all programs help develop a sense of loyalty and responsibility to the employer? Do younger men recognize the importance of establishing good rapport with older employees? Is personal appearance important? Is any dress code needed?

-- Can the model help identify actual needs of an employer other than measure a former student after a period of employment? The length of the period of employment before evaluation was discussed earlier in a little different framework. There were two views: 1) three to six months, or 2) six months to one year. This period of time is necessary especially if it is the first employment.

-- Can industry record and delineate between vocational student and non-vocational student, between graduate and non-graduate? What is a graduate--someone who has completed one course, one subject, or two years? There is a need for common definitions between educational institutions and industry. What are the expectations of vocational students and employers of vocational students? What is their role? Is there a difference between an actual role and the expected role? Are expectations of students and employers the same, or, if not, at least known to both?

-- Is too much expected of the technical school? Is not the twig already bent in attitudes of loyalty, promptness, neatness, willingness to work, before entering vocational training? Can vocational training increase and better the student by providing and encouraging extracurricular activities through which the student can achieve leadership, cooperativeness, and a belonging feeling?

-- Does the model provide recognition of kindred activities or attributes? Also, can it distinguish between an entrance level and the extent of vocational training? Several times the question was asked, "At what occupational level do we expect this model to be used?" This generated considerable debate. All that was decided was that it makes a great deal of difference. It may be useful at several levels but probably would not be very effective across various levels.

-- Programs were discussed. Complete course or not, should there be a certificate of completion for specifics? Copies are valuable for personal folders. A question was raised about who has access to records. This material probably loses value as time passes and experience increases.

-- Can the model be used to evaluate the product when the student has been trained for a very specific skill? What happens when he is given regular training and then assigned to a very specific task? How well does the model evaluate the product in this case? What would the employer's evaluation of the training be or what would the student's evaluation of the vocational program be at this time? Would either be valid? Would the model reflect this?

SESSION 2

SUMMARY

Employer Responsibilities:

-- Employer responsibilities fall in two general categories: expectation of employee and evaluation. Expectation of employee calls for the employer to define standards for the necessary skills, working requirements and and restrictions, appearance, conformities expected, attendance, and general acceptance by older employees. Upon request, employers should furnish this information to schools.

-- Evaluation responsibilities usually lie with the supervisor or the Personnel Department. Evaluation includes handling and recording violations on the job, feeding back into the model for overall performance evaluation, and evaluation for promotions. Customs of in-plant evaluations are widespread. Some employees are aware of this and some are not. Can or should this be feedback?

-- Either the supervisor or the personnel department usually supplies information on evaluation of employees to schools.

-- If math and blueprint reading are normally adequate for a production person, but Industry "A" also requires that he know "feeds and speeds", then Industry "A" should alert the school involved of that fact, or that void may throw off the validity of the models evaluation. Schools and employers must be alert to special needs and work together to fill those needs.

-- Any evaluation of a students' performance would have to be started by a request from the school. There will be no automatic feedback.

-- Timing for evaluation was discussed at some length. Use of the model should be continuous, especially in the first year; e.g., after two weeks, after two months, after a year. There are many ideas on this, and no unanimous opinion. There are some wide-ranging feelings regarding the use of the model. Can it be used in all circumstances? Can the same model be used? Must the survey be narrow and very carefully delineated in each use?

-- Great care should be exercised in the use of the model. Testing should probably be done on a face to face basis and by an experienced person. Gathering accurate data for any model is a problem. A questionnaire by mail has doubtful value. Considerable conversation took place regarding systems used and results obtained from surveys or evaluation forms.

-- Sometimes the front office does not really know just what sort of courses are really needed. The Personnel Department or even the first line supervisor may be more knowledgable in this area.

-- Congruence of information for feedback purposes:

1. It is important to compare feedback information from employees with that from employers.

2. One should solicit more information on the essentials and less on items which are not of prime importance.

3. It must be learned "Why" a student said his training did him little good. Was he assigned to a totally different job, etc.?

4. Evaluation forms must be designed to be accurate. Remember, it takes time and costs money to fill out forms. These must be articulate, meaningful questions. Evaluation design is most important.

5. Some do not see the model as a measure of an individual, but brought together these evaluations from a pattern. There is some debate here. There is a need to measure both representatively and also in-depth. However, a personal evaluation is important.

6. Does this model help sort out those who were crowded into a program by a counselor without much experience or background and who did not adapt as an employee?

Educational Institution Responsibilities:

-- The responsibilities of an educational institution include solicitng from the employer his expectations of roles and skills, soliciting from students their expectations as employees, and getting the employee's evaluation of skills and preparation of expected roles, both as an employee and in society.

-- Role expectations include the following:

1. Is there a difference between graduate and non-graduate? Define graduate.

2. Is more expected of a graduate in a skill area?

3. How much advance general knowledge of what he will be doing can a student expect?

4. Can a student be informed to some extent as to when he will be more confident in areas in addition to his skills, so he will be a more relaxed, confident, safe and productive worker?

5. What is the accepted dress code?

-- Industry/Education Institutions need more liaison such as career days, exchanging persons with expertise; i.e., teachers to industries and practitioners into lecturing positions.

-- There is some debate regarding better counseling as far back as grade 6 and up. Industry can explain to younger children the need for math -- geometry, etc. -- that a teacher can do. Junior High School students need to make some judgments in vocational terms.

-- The success of a first-time employee probably rests more with attitude than with his skill attainment.

-- How does the model allow for these items? It seems all a part of the evaluation.

-- What effect does the new Occupational Safety and Health Act have on the vocational technical programs? Are new teaching methods and training techniques needed?

-- Some method should be developed to consider, allow and measure extracurricular leadership roles.

Interrelationships to State and Federal Requirements:

-- The Federal Government is looking at job cluster evaluation as a basis for funding.

-- If this Model will fulfill these requirements, it may preclude a model being given to [illegible]

-- It is important that State Departments of Education keep educational-technical institutions alerted to requirements. What sort of evaluation schemes do they have to evaluate their product?

-- Educational programs must raise the awareness level of students regarding federal safety regulations and their responsibilities to the employer in maintaining minimum safety practices.

-- There are several methods of feedback. However, there is a feeling that a surplus of such material is now requested by governmental agencies. Even some officials attest that they do not know what happens to these forms after they are filled out. The results are not seen by these officials. Feedback can be achieved through meetings with teachers and with legislators regarding their concepts of vocational education. Vocational advisory boards are great sources of information and are anxious to share it. Other methods include circulation of written questionnaires and the use of advisory groups. Teachers should be required to visit employers of their students to learn what programs they needed and how the students are doing. An honest assessment of both should be the goal.

SESSION 3

SUMMARY

-- There is need to:

a. measure skills related to entry level,

b. up-date needs and attainments, and

c. to evaluate advancements at high levels.

-- There is a need to measure attitudes.

-- It is easier to verbalize on skills than on attitudes. Unless we take "skills" as a whole, which would be too broad to handle, the individual skills probably lend themselves to some type of measurement.

-- Specifically, attitudes needing evaluation are: safety, respect of others, attendance (check back to school attendance), general appearance, honesty, loyalty, and responsibility.

-- There is a need to measure knowledge.

-- What technical information is required? What are the job opportunities? How do these relate? Is there a cross-over of both skill and attitude? Does this reflect in the model?

-- What part does the work environment play? Where do benefits fit in? Are these factors reflected, consciously or not by a former student when we try to get an evaluation from him?

The following are suggestions for the assessment of career performance:

-- What is the role expectation of vocational-technical graduates and non-graduates?

-- It is necessary to impress upon the student the need for loyalty and dedication to his job and to emphasize importance of his work. There is nothing wrong with being a milling machine operator. Each job has some status.

-- Over and over the concern was expressed to fit the student into the job for which he was trained and where he feels comfortable. Does the student feel underemployed? Can our model help assure good placement?

-- It is agreed that a student, graduate or non-graduate, should be a successful member of society.

-- School has responsibility to inform the student that he will likely be a number in a large work force and his success will be coupled with his ability to produce.

-- A school is a series of instructors. They contribute to both the skills and attitudes learned. The instructor plays a very important role in the evaluation process. No matter what instrument is used, the success or failure of that process hinges on the ability of the instructor to reach the student.

-- The question arose, "Do employers expect more of and pay more for a vocational-technical graduate than for a non-vocational-technical graduate?"

-- Too frequently it was felt that the employer made no differentiation.

-- Maybe there is a serious problem of non-recognition by the unions.

-- The other recurring question regarding the model is, "Should the final instrument be general enough to cover all career areas and training, or should it be specific enough to cover each career area?

-- There is a great need for material for all students dealing with business. There is a need for basic economic facts, record keeping, profit and loss statements, production costs and marketing problems. They should understand our free enterprise system and the need for profit if jobs are to continue and payrolls are to be met.

SESSION 4

SUMMARY

-- How do we determine technological competencies for 1980?

-- The Federal Government is doing continual and wide-ranging surveys.

-- Do we then try to improve our general technical programs and help develop social and attitudinal aspects? It was stated that 80 percent of time is devoted to technical training. Maybe we are out of balance here. Can our model reveal either a plus or minus rating on this?

-- It was stated that technical skill obtains a job while attitudes and social aspects keep it.

-- There was considerable debate as to whether, as a group, social aspects are easier to handle than technical aspects.

-- There was general agreement that there is excessive duplication of effort.

-- When a new technological twist appears, industry should immediately alert local schools of their needs, and the local schools should be able to respond rapidly. This is one way to be technically prepared for 1980.

-- There is a real possibility educators have oversold their ability to change social attitudes. Most attitudes have been pretty well set by the time the student enrolls at the vocational-technical school.

-- It is necessary to instill in students the fact that their employer, in order to meet his payroll, must make a profit and that profit must come from productivity of a worker. The worker must produce reliable goods at a price the consumer can afford to pay. If these precepts are taught, many of our social aspects may take care of themselves.

-- It seems important to recognize that younger people want change. The changes of the last 10-15 years in our social, family, and moral structure are bound to reflect in the workers, and everyone is feeling this change.

-- Are the procedures and materials used today in junior and senior high schools as current as they should be? The question remains, "How can a teacher prepare a student for a place in a work environment he himself has never seen?"

-- Also a question was raised about what should be added to the curriculum to fulfill the worker's social requirements of the 1980's, and how would its effectiveness be measured.

-- The statement was made that counseling has been oversold. What will be the technical needs of the 1980's?

-- How will unions be organized? How will industry be organized? How does the government influence our overall program (retirement, social securities, etc.)? Should we consider in-service training as part of our model? If so, product evaluation demands that parameters be set for its use any given time.

-- In order to determine the value of pretraining in any one year, test early and often. Remember, the unions often give a probation employment period. Zenith, John Deere, Chemagro and Boeing all use evaluation. There are different systems, and the evaluation timing varies, but all are searching for accurate evaluation of employees.

-- The key is close liaison between schools and employers. If there is to be significant progress, we need dollars in large volume.

-- Is too great an effort being made to get youths to commit themselves early for careers?

Is career education desirable or measurable? Career education is not synonymous with vocational education according to this model. Perhaps the title is in error, but this is probably what the author intended.

-- It is difficult to project 1980 technical needs. Post-secondary schools will be tied much closer to the high school, especially the area schools. Vocational training in each school, with each school being totally equipped, is not realistic. Arrangements must be made for more economical use of a totally equipped school. Credits must be more easily transferred from vocational-technical institutions to universities, etc. The problem of accrediting was discussed briefly. Most agreed that certificates and diplomas have a valid place in the educational system.

-- How will the model function? Will it evaluate students from high schools, technical schools, vocational programs, and two-year programs?

-- Where does our accreditation program fit into this entire program? Can a standard be developed as a basis for accreditation? Will this model contribute to this in the years to come? We may find accreditation and funding closely tied together.

-- There must be a new source of funds. Our present level of vocational-technical education probably cannot be maintained through real estate and income taxation. Most funds will be Federal with accompanying controls.

-- A debate ensued on how to develop a five-year program, as well as a ten-year program. Education is or should be flexible. The ability to forecast changes should be developed so that the changes can be dealt with as they come.

-- Fiscal matters and job needs are being planned further in advance. It is mandatory that technical schools be able to adapt as changes are forecast. Real money, flexibility and alternatives must always be kept in the forefront.

-- Maintaining a broader base of course offerings will keep vocational-technical personnel in a position to adapt more quickly when the need arises. There is probably considerable merit in the wide use of advisory boards. They bring in a wealth of information on which future judgments can be made and there is the distinct possibility that some of these advisors may have some political influences. Cooperative programs with industry have many possibilities. Leasing of some equipment may help ease the budget situation and still update vocational shops. If hardware and programs are not kept up-to-date, industry will move in and develop their own programs.

APPENDIX I

NOTATIONS FROM
CONFERENCE GROUP 4

Group Leader: Wayne Wheeler

Group Members:

Dave Adams
Robert Crowley
James Sanders
Glenn Strain
Gordon R. Kutscher
Robert Ware
James Walker
Don Klosterman

SESSION I

SUMMARY

-- The primary focus of this session is product evaluation. The goal is to devise a technique to evaluate the product and to feed back corrective information from industry to education to update the training sequence. Evaluation should commence with the first occassion of employment of the product of the school.

-- The education system includes both formal and informal education. Informal education may take place in industry. Formal education alone cannot accomplish the entire job of training.

-- The responsibility of education and industry must both be defined. Industry needs to define the expectations it holds for the graduates of training programs.

-- Advisory councils must play an increased role in curriculum changes and in the guidance of training systems. Advisory committees should show us the way to stay ahead of industry. The role of advisorys must be defined. Evaluation cannot be left entirely to an advisory council. A council can help evaluate the process (internal within the education system) but may have difficulty doing product evaluation.

-- A properly formulated advisory council can give invaluable advice and guidance for the various programs.

-- Major companies and independent small businesses may have a mutual disagreement between specialists and generalists within skill areas.

-- It was felt that training should be designed to provide the learner a set of specific competencies and should not be compelled to operate in a lock-step time line common for all learners.

-- General education, at the high school level is an endurance contest. It isnot a performance activity. The range of competence of any general education is extensive. But a program for each individual product should specify the competence he can exhibit and market after training.

-- "Education is like war, it is too important to be left to professionals."

-- Before the product can be evaluated, it must be defined. The product is the graduate or non-graduate of a training sequence designed to prepare an individual to earn a living.

-- The demonstration of competency should play a greater part in industry screening procedures.

-- The model lacks provisions for social skills measurement and attitudinal measurement.

-- When should sociometrics be applied?

-- Three to five year intervals between evaluations of an individual are too great. The model should provide for continuous evaluation.

SESSION 2

SUMMARY

-- The product to be evaluated through this model is an individual who has terminated training and has left a school setting to accept employment.

-- Employers seem to be able to describe the attitudes desired for an individual for a specific task.

SESSION 3

SUMMARY

-- The product evaluation must be accomplished after the individual has left formal training. The training institution must evaluate the individual within the training cycle.

-- Would it be necessary for industry to establish the criterion for evaluation when the individual leaves the training sequence and enters industry? Certain factors are common to both the training and industrial setting. These include attendance and attitude.

-- Institutional evaluation of the product is needed by industry.

-- Industry should provide feedback on validity and completeness of the training.

-- The validation of the training should occur more than once. The consumer evaluates the product but the producer must also validate the product.

-- An official transcript has course titles, grades and credits for each course. When an employer wants to hire he can receive the transcript. The course content, attitude and social skills are not there. Instructors do have that information but it is not part of the transcript. There are limitations on what can become part of the transcript.

-- The large corporations can and do analyze positions but the willingness and ability of small business and industry to do so requires more consideration.

-- Vocational technical education must play a greater role in placement. Placement should be based on the specific needs of a position.

-- Adaptability, attitude, attendance and cooperation are prime factors in selecting employees, but an individual is selected for a job because he has required technical skills.

-- Problem solving, role playing and simulation should become more prominent in training methodologies.

-- The problem we are addressing ourself to at this point is can we use the same instrument for both the employer and employee or must there be two instruments.

-- We have talked about three instruments.

1. The institutional evaluation.

2. The employer evaluation does the product meet employer expectation and

3. The employer evaluation -- does the job meet employee expectations.

-- Measurement of overtraining, undertraining and mistraining should be carried out.

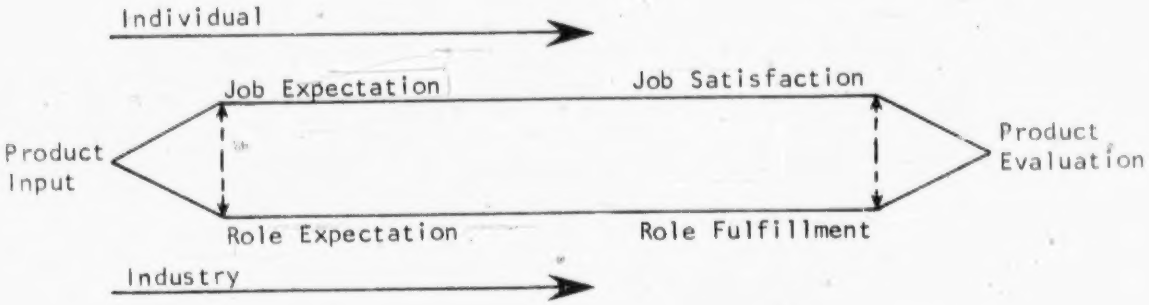
-- Industry should communicate the performance level required for specific positions.

- -- The application of skills learned after placement should be measured.
- -- There should be congruence between the employer and employee information.
- -- Performance of the product is the key to success.
- -- Industry has the responsibility of preparing specific criterion needed for projected occupations.
- -- An instrument is needed to validate the institution evaluation. An instrument is needed to assess the product. An instrument to assess the congruence of the institutions, goals and objectives and the product's job satisfaction is also needed.

SESSION 4

SUMMARY

- -- The fourth session concerned itself with model modification. The alternative diagram shown below was proposed.


Individual
Job Expectation
Job Satisfaction
Product Input
Product Evaluation
Role Expectation
Role Fulfillment
Industry

Arrows indicate potential conflict.

-- The amount of dissentience between the employer and employee is the evaluation. Negative dissentience on the part of both the employee and employer causes concern to increase exponentially and would indicate the need for change in the training system.

-- It was resolved after considerable discussion that this model concept did not essentially differ from the model proposed by the project staff.

-- Discussion ensued around the point of departure from the training sequence. Where does the responsibility for evaluation of the product commence? As a matter of reference it was determined that age 16 was an age of employability and thus becomes the point of evaluation for individuals leaving the training system. Evaluation should not be limited to vocational and technical training but should include the entire educational system.

-- The social aspects of performance were discussed in depth. It was concluded that the evaluation should involve the total person and not be limited to job performance and attitudes. Society holds the education system accountable for the societal performance of the individual.

-- It was suggested that the proposed model be modified to include role expectations of society, the employee, and employers.

SESSION 5

SUMMARY

During this session the group reacted to the following statements:

1. Technical skills will attain the job but social attitudes will retain the job.

2. Technical training is over-emphasized over the social and attitude aspects.

3. We should insert the evaluation of the social and attitude aspects but not at the expense of the technical aspects of the job.

4. Attitudes are easier to deal with than programmatic and technical problems.

-- The group experienced much more difficulty agreeing on the social-attitudinal factors to be evaluated than was true of the technical factors. It is more difficult to motivate and evaluate students in attitudinal and social areas than in areas related to technical ability.

-- Social factors must be integrated with technical factors.

-- High school counselors need a better understanding of the realities of the world of work. Industry and education need to effect a program to encourage staff interchanges. One way to promote the interchange between industry and education is to explore profits which could accrue to industry.

SESSION 6

SUMMARY

During this session competencies required of technological employees by 1980 were projected.

-- Factors Affecting The Technologies By 1980:

A. Flexibility is the watch word.

B. What will happen to the work ethic? It is being questioned.

C. Schools with walls may not exist in 2000.

D. Computer impact will be great.

E. Criteria for Diploma: Amount of learning - Not amount of time.

F. Continuing education will be emphasized.

G. "Re-cycle Education" !!

H. More education evaluation "Accountability".

I. A play on words - "Educators cannot plan ten years ahead and if they could not they are dead."

J. Articulation of all education. (K - 12) - (13 - 14) to retirement.

K. Develop new kinds of advisory boards.

L. Teach how to learn after graduation.

M. Competition from the Orient. What do they have that we didn't have? It's not simply cheap labor.

N. Lack of efficiency of the United States productivity.

O. Cluster concept re-enforced.

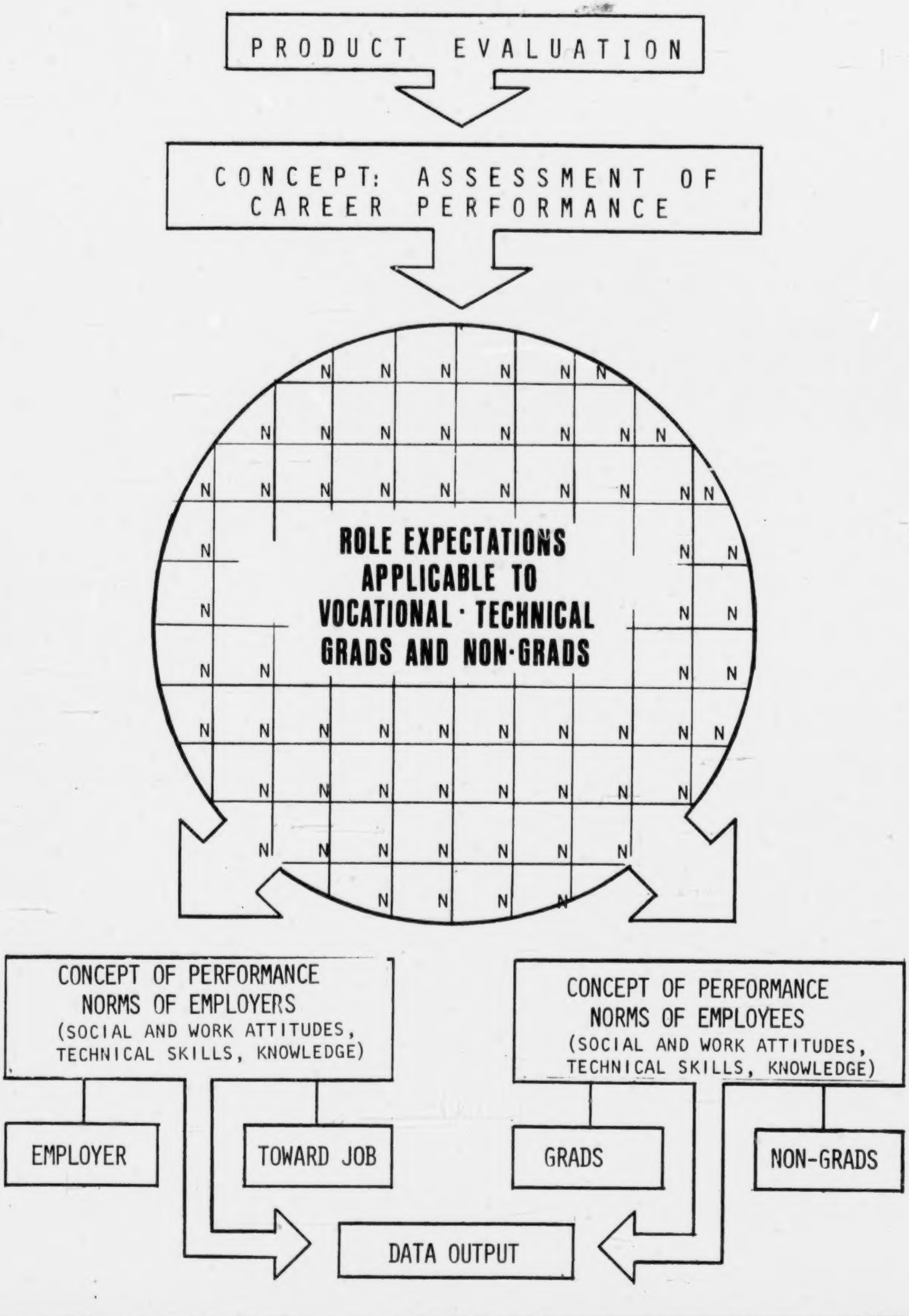
P. Increase in service occupations. Relative decrease in manufacturing occupations.

Q. Ecological factors.

R. Technology era is ending.

S. End of "Throw Away Era".

APPENDIX J


PRODUCT EVALUATION
CONCEPT: ASSESSMENT OF CAREER PERFORMANCE
ROLE EXPECTATIONS APPLICABLE TO VOCATIONAL·TECHNICAL GRADS AND NON·GRADS
N
CONCEPT OF PERFORMANCE NORMS OF EMPLOYERS (SOCIAL AND WORK ATTITUDES, TECHNICAL SKILLS, KNOWLEDGE)
EMPLOYER
TOWARD JOB
CONCEPT OF PERFORMANCE NORMS OF EMPLOYEES (SOCIAL AND WORK ATTITUDES, TECHNICAL SKILLS, KNOWLEDGE)
GRADS
NON-GRADS
DATA OUTPUT

PROJECT 7

SELF-INSTRUCTIONAL CAREER GUIDANCE SYSTEM MODEL

PROJECT PERIOD
July 1, 1971 - June 30, 1972

PROJECT INVESTIGATORS
J. Horner, R. Douglass, D. Zikmund

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incorporated
INSTITUTE FOR
EDUCATION AND
TECHNOLOGY

Ninth and Avenue H
1340 Air Park West
Lincoln, Nebraska 68524

USOE Contract No.: OEC-0-71-1253
EDUTEK, Inc.

PROJECT #7

ANNUAL REPORT

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I. Purpose:

There is a lack of individual accessibility to factual current information needed for career choice, special educational opportunities, and for decisions about appropriate training for careers. This lack leads to critical problems for minority and disadvantaged students.

The initial survey of the literature indicates that several models of computerized career guidance systems exist. It was determined that the first year's objectives should be expedited by identifying and summarizing these systems.

The principal investigators have recently developed one hundred nineteen mediated (slide-tape) career information presentations. The activities should be extended to include the refinement of these presentations.

A third goal should be developed to integrate the computerized and mediated dimensions into a directed-individualized-instructional mediated career guidance system for application in elementary, junior high, and senior high schools.

II. Objectives:

Project activity has been related to the completion of the following objectives:

1. Identify and summarize computerized career guidance systems presently in use.
2. Refine mediated-career presentations to facilitate dissemination.
3. Outline a directed-individualized-instructional mediated career guidance system which integrates computerized information and mediated presentations for school systems.

III. Methodology:

It was agreed that the following steps were required for the accomplishment of the first objective:

A. A QUERY Search through the ERIC systems and a manual search that included dissertation abstracts, education indexes, and research in education was conducted by project staff.

B. Various system directors were personally contacted and summaries describing each system and its current status were prepared.

C. A complete bibliography was also compiled and added to the summaries.

In accordance with the second project-objective, the one hundred nineteen mediated career information (slide-tape) presentations that were previously developed by the principal investigators were reviewed and revised where necessary. New interviews and replacement slides were obtained, and new materials have been inserted into existing presentations.

A test battery was compiled for the evaluation of the mediated presentations. These include the following:

1. "Test on Knowledge of Occupations" by Zikmund, Douglass, Horner
2. "Occupational Aspiration Scale" by Archibald Haller
3. "Opinions About Work" by the Rocky Mountain Educational Laboratory
4. A subjective instrument patterned after Darcy and Powell's experimental junior high course in "Occupational Opportunities and Labor Market Processes", Athens, Ohio, at the University Center for Economic Education, 1968.

The outline of directed-individualized-instructional mediated career guidance system which integrates computerized information and mediated presentations for school systems was prepared by (a) defining the nature of the problem; (b) conducting a literature search; (c) identifying sources of input (occupational information and computer systems and occupational development theory based on vocational development theory); and (d) contacting the Ohio Staff to explore means of coordinating with the Center's Career Education activities.

IV. Findings:

Computerized career guidance systems presently in use are identified and summarized in Appendix A.

A report of activities related to the refinement of the mediated career information presentations is attached as Appendix B.

The "Outline of a Directed, Individualized, Multi-Media, Career Guidance System Which Integrates Computerized Information and Audio-Visual Presentations for School Systems" is attached as Appendix C.

APPENDIX A

A SUMMARY OF COMPUTERIZED CAREER GUIDANCE SYSTEMS

Self-Instructional Career Guidance System Model

Institute for Education and Technology
EDUTEK, Incorporated
Ninth and Avenue H
1340 Air Park West
Lincoln, Nebraska 68524

Principal Investigators

J. Horner, R. Douglass, D. Zikmund

1972

PLAN - PROGRAM FOR LEARNING IN ACCORDANCE WITH NEED

Project Director(s): John C. Flanagan and David V. Tiedeman
Location: Palo Alto, California

ROCHESTER CAREER GUIDANCE PROJECT

Project Director: David B. Youst
Location: Rochester, New York

SIGI - SYSTEM OF INTERACTIVE GUIDANCE & INFORMATION

Project Director: Marvin R. Katz
Location: Princeton, New Jersey

TGISS - TOTAL GUIDANCE INFORMATION SUPPORT SYSTEM

Project Director: None specified
Location: Bartlesville, Oklahoma

VIEW - VITAL INFORMATION FOR EDUCATION & WORK

Project Director: Dr. Edwin Whitfield
Location: San Diego, California

BIBLIOGRAPHY

REFERENCES

TABLE OF CONTENTS

AUTOCOUN - A COMPUTER-BASED AUTOMATED COUNSELING SIMULATION SYSTEM

Project Director(s): Dr. John W. Loughary, Deloss Friesen, Robert Hurst, John F. Cogswell, Donald P. Estavan
Location: Santa Monica, California

COIS - COMPUTERIZED OCCUPATIONAL INFORMATION SYSTEM

Project Director: Dr. Joseph T. Impellitteri
Location: University Park, Pennsylvania

COMPUTER-ASSISTED GUIDANCE SYSTEM

Project Director: Thomas W. Smith
Location: Covina, California

CVIS - COMPUTERIZED VOCATIONAL INFORMATION SYSTEM

Project Director: JoAnn E. Harris
Location: Villa Park, Illinois

ECES - EDUCATION & CAREER EXPLORATION SYSTEM

Project Director(s): Frank J. Minor, Donald E. Super, Roger A. Myers, Al Mallory
Location: New York, New York

GUIDPAK - UNIVERSITY OF OREGON GUIDPAK SYSTEM

Project Director(s): John W. Loughary and Murray Tondow
Location: Eugene, Oregon

ILS - GUIDANCE INFORMATION SYSTEM

Project Director: Arthur M. Kroll
Location: Boston, Massachusetts

ISVD - INFORMATION SYSTEM FOR VOCATIONAL DECISIONS

Project Director: Dr. David V. Tiedeman
Location: Newton, Massachusetts

OIAS - OCCUPATIONAL INFORMATION ACCESS SYSTEM

Project Director: Bruce McKinlay
Location: Eugene, Oregon

AUTOCOUN

TITLE: A Computer-Based Automated Counseling Simulation System

PROJECT DIRECTORS: Dr. John W. Loughary, Deloss Friesen, Robert Hurst, John F. Cogswell, Donald P. Estavan

PERSON TO CONTACT: Systems Development Corporation
Santa Monica, California

SYSTEM CHARACTERISTICS:
Interactive with students
Analysis of student data
Predicts post-high school performance
High school course selection

COMPUTER DATA:
Student data
Local prediction norms
Curricular offerings
Instructions & rules given by counselor
Repertoire of responses
Instructions for data analysis and synthesis

TERMINAL REQUIREMENTS: (1966 information)
TWX Model 31 Teletype Terminal

SYSTEM DESCRIPTION: Autocoun is an attempt to simulate with a computer selected aspects of the counseling behavior of an expert counselor. The testing of the automated counseling system was in March, 1965.

The objectives of the project can be stated as follows: (1) to determine which aspect of a counselor's pre-interview and interview behavior can be automated; (2) to determine counselee attitudes toward an automated counseling system; (3) to further test a method for analyzing counseling behavior; and (4) to obtain guidelines for further exploration of the use of computers in counseling and related areas.

There are essentially two kinds of validation data consisting of (1) measures of similarity between the automated counseling system and human counselors regarding pre- and post-interview pupil appraisal, and (2) measures of similarity regarding interview output, that is, course selections.

In regard to pupil appraisal, some believe that the basic shortcoming of Autocoun is that it lacks certain data possessed or possessable by the human counselors. Autocoun deals strictly in terms of probability, working from an expectancy table, using the rules that the model counselor agreed that he uses. Apparently, a counselor is able to better the predictive data with his feelings and impressions about the counselee during an interview. It is believed that some of these additional data and rules used by a counselor could be identified and built into Autocoun, and thus, in regard to extent of simulation, increase its validity.

Pupils had few problems using Autocoun, and in general enjoyed interacting with the computer. While this may be attributed to the novelty of the situation, it does demonstrate that the computer-based system poses no particular threat to pupils.

In conclusion, Autocoun does demonstrate the operational feasibility and suggests the potential value of a computer-based pupil information system, capable of direct interaction with students.

At the present time two versions of Autocoun exist. One in Palo Alto entitled Autocoun with Systems Development Corporation and one entitled GUIDPAK in Eugene, Oregon with Dr. Loughary. According to available resources, neither system is presently in operation.

Loughary, John W. and Tondow, Murray, "Computers as Substitute Counselors", Educational Technology, Vol. 9, March 1969.

Super, Donald E., "Autocoun: A Computer-Based Automated Counseling Simulation System", Computer-Assisted Counseling. New York: Teachers College Press, 1970.

COIS

TITLE:	Computerized Occupational Information System
PROJECT DIRECTOR:	Dr. Joseph T. Impellitteri
PERSON TO CONTACT:	Dr. Joseph T. Impellitteri Department of Vocational Education The Pennsylvania State University University Park, Pennsylvania 16802
SYSTEM CHARACTERISTICS:	Non-functional at the present time Students interacted with the computer Students desiring occupational information were provided: 1. Discrepancies between students ability-preference file and occupation requirements 2. Two-minute taped interview with a worker 3. Image projected on screen showing worker engaged in 4 tasks 4. 150-200 word job description printed for student
COMPUTER DATA:	Occupational information Student data
TERMINAL REQUIREMENTS:	Teletypewriter Tape recorder Slide projector
SYSTEM DESCRIPTION:	The functions of the computer in the Computerized Occupational Information System are to store up-to-date information about selected occupations and to present the stored information to ninth-grade students via typewriter printout, tape recordings, and slide projections. Student interaction with the computer occurs at an IBM 1050 computer terminal. One unique feature of the system is selective presentation of occupational information. The selection of the materials to be presented to a student is based on his General Aptitude Test Battery (GATB) profile, which

is stored in the computer memory unit. Another feature is the manner of presentation of the materials. Not only are materials typed out at the console where the student is seated, but they are also presented on tape recordings and slide projections, all integrated under computer control.

Super, Donald E., "A Computerized Occupational Information System", Computer-Assisted Counseling. New York: Teachers College Press, 1970.

TITLE: Computer-Assisted Guidance System

PROJECT DIRECTOR: Thomas W. Smith

PERSON TO CONTACT:
Thomas W. Smith
Research & Pupil Personnel Services
Covina-Valley Unified School District
Covina, California

SYSTEM CHARACTERISTICS:
Non-interactive
Batch processing
Clerical duty
Primarily administrative
Establishes norms & reports abnormalities
Monitors student's class registration based upon:

1. Appropriateness
2. Feasibility
3. Consistency
4. Placement
5. Load
6. Missing Data

COMPUTER DATA:
Grade point averages
Aptitude test scores
Achievement test scores
Course requirements
Post-graduate plans

TERMINAL REQUIREMENTS: None

SYSTEM DESCRIPTION: "The Computer-Assisted Guidance System has provided the administrative and instructional staffs of the district with extensive information regarding student populations, their plans, their performance histories, and their aptitude and achievement test scores. These data become part of the information system and the general intelligence of the administration and the instructional leadership of the schools." As a result, instructional opportunities for the total range of students have been improved. The computer handles the bulk of the clerical activities that often enmesh counselors.

Smith, Thomas W., "Development of a Research-Based and Computer-Assisted Guidance System", Educational Leadership Research Supplement, Vol. 25: 754-760, May, 1968.

CVIS

TITLE: Computerized Vocational Information System

PROJECT DIRECTOR: JoAnn E. Harris

PERSON TO CONTACT:
JoAnn E. Harris, Director
Lorraine Foster, Counselor
Willowbrook High School
1250 South Ardmore
Villa Park, Illinois 60181

SYSTEM CHARACTERISTICS:
Uses the 2-dimensional classification developed by Dr. Anne Roe
Occupations divided into six levels
Occupations divided into eight categories of interest
Battery of tests administered to students as sophomores
Junior high students interact with computer -- computer provides information relative to occupations which should be of interest to student -- he/she then uses audiovisual media which explains the kind of people interested in that kind of work
Provides information on request of senior high students

COMPUTER DATA:
Student permanent records and battery of tests
Occupations
Educational opportunities (4-yr. colleges, community colleges, specialized and technical colleges)
Apprenticeships
Local Jobs
Military information

TERMINAL REQUIREMENTS:
IBM 2260 cathode ray tube
IBM 1053 printer
IBM 2265 terminals

SYSTEM DESCRIPTION: In January of 1967 the original proposal was submitted to the Illinois Research Coordinating Unit. The Willowbrook Computerized Vocational Information System uses computer technology mainly to make individualized vocational information more readily available to students and counselors.

The system's computer serves as an automated library for vocational and student cumulative-record information. Students have on-line access to the vocational information in the system. Counselors have on-line access to the vocational and student information and also receive off-line reports of student interaction with the computer. A 20 min. (16 mm. color film) entitled "Saturday's Child" is available.

"The Willowbrook Computerized Vocational Information System", Computer-Based Vocational Guidance Systems. Washington, D.C.: U.S. Government Printing Office, 1969, Superintendent of Documents Catalog No. FS 5.225:25053.

ECES

TITLE: Educational and Career Exploration System

PROJECT DIRECTOR: Frank J. Minor, Donald E. Super, Roger A. Myers, Al Mallory

PERSON TO CONTACT:
Roger A. Myers
IBM Corp.
Advanced Systems Development Division
Columbia University
1234 Amsterdam Avenue
New York, New York 10027

SYSTEM CHARACTERISTICS:
Interactive with students
Problems of educational and vocational planning
Monitors student progress for counselor
Provides educational and occupational information
Designed for youth during latter growth stage through reality considerations and career selection
Allows student to explore data banks

COMPUTER DATA:
Occupational information (386 occupations updated 3-5 years)
Military data
University and junior college curriculum data
College finder data (includes all Michigan Programs both public and private, plus 1800 national programs)
Student profile:

1. High school grades
2. Gross prediction of educational attainment interest in 8 vocational fields
3. Self-appraisal of intellectual strengths and weaknesses and areas of interest
4. Major program -- with 15 majors

TERMINAL REQUIREMENTS:
Typewriter terminal
Filmstrip under computer control

SYSTEM DESCRIPTION:

Through the use of computer technology, the IBM Experimental and Career Exploration System reduces the information handling problems involved in making educational and vocational facts readily available and in relating these facts to pertinent information about the students.

The system is designed for use by students as one part of the educational and vocational guidance services offered in schools. Student use of this system enables the student to sharpen his focus on career goals and the means by which they can be achieved. The presence of the system in the schools also enables the counselor to function at a higher professional level. The system:

1. Familiarizes the student with problems of educational and vocational planning,
2. Provides the counselor with information about student progress in formulating plans, and
3. Frees the counselor from having to maintain a general educational-occupational information library.

"The IBM Experimental Educational and Career Exploration System," Computer-Based Vocational Guidance Systems. Washington, D.C.: U.S. Government Printing Office, 1969, Superintendent of Documents Catalog No. FS 5.255:25053.

"Applications 1,2,3, and 4", (2). An Experimental Educational and Career Exploration System, Personnel and Guidance Journal, Vol. 49, No. 3, Nov., 1970.

GUIDPAK

TITLE:	University of Oregon GUIDPAK SYSTEM (supported by Instructional Systems Corporation)
PROJECT DIRECTORS:	John W. Loughary and Murray Tondow
PERSON TO CONTACT:	John W. Loughary University of Oregon Eugene, Oregon 97403
SYSTEM CHARACTERISTICS:	Not computer-based or managed Project will include optional computer storage and retrieval of occupational information
COMPUTER DATA:	Exploratory materials of entry-level jobs Monitor student progress for counselor Multimedia resource career development materials Local job opportunities
TERMINAL REQUIREMENTS:	None specified Note: Present information indicates that this system has been revised and now is called "Occupational Information Access System".
SYSTEM DESCRIPTION:	The University of Oregon GUIDPAK System is designed to help counselors provide entry-job information to students who have taken neither college preparatory nor specific vocational work in high school. The system motivates students to actively explore entry-level job opportunities by involving them in the compilation of job data. It includes student materials for use in evaluating job opportunities and counselor materials for use in supervising students. Although the system is not computer-based or managed, it includes optional computer programs for storing and retrieving the occupational information which it generates.

"The University of Oregon GUIDPAK System", Computer-Based Vocational Guidance System. Washington, D.C.: U.S. Government Printing Office, 1969, Superintendent of Documents Catalog No. FS 5•225:25053.

ILS

TITLE:	Guidance Information System
PROJECT DIRECTOR:	Arthur M. Kroll
PERSON TO CONTACT:	Arthur M. Kroll Interactive Learning Systems 1616 Soldiers Field Road Boston, Massachusetts 02135
SYSTEM CHARACTERISTICS:	Interactive with clients Requires no student data No monitor system available Terminal may use punch tape to record information in addition to printout Provides occupational information, vocational and technical school information and college information
COMPUTER DATA:	Occupational information: 1. Detailed information on 1200 occupations 2. Lists 3,000 related occupations Vocational and technical school information: 1. Information on 400 occupations 2. Includes over 400 schools 3. Particular characteristics of schools College information program: information on 2,000 colleges and universities -- over 300 characteristics for each school
TERMINAL REQUIREMENTS:	Teletypewriter terminal
SYSTEM DESCRIPTION:	The ILS Guidance Information System utilizes time sharing for making data accessible on a virtually instantaneous basis and retrieved according to user specifications. The ILS service requires a teletypewriter terminal and a telephone. The user places a call to the computer through normal telephone lines and types simple command letters requesting the desired information. The teletypewriter types the response from the data bank in the computer.

Using the information received after each command, the student can modify the selection of characteristics that are important to him and explore a number of different combinations. He can also change from one program to another easily and quickly, as from occupational information to college information.

A unique aspect of the ILS Guidance Information System is that it makes it possible for the user to interact directly with the information.

Kroll, Arthur M., "Making Guidance Technology Work...or, Trying to Bell the Cat", Counselor's Notebook, Vol.7, No. 7, March 1971.

ISVD

TITLE:	Harvard - Needs - Newton Information System for Vocational Decisions
PROJECT DIRECTOR:	Dr. David V. Tiedeman
PERSON TO CONTACT:	Dr. David V. Tiedeman Information System for Vocational Decisions Project NESDEC Center for Educational Software Development 55 Chapel Street Newton, Massachusetts 02160
SYSTEM CHARACTERISTICS:	Not functional at the present time Students interacted with the computer Provided information by direct inquiry Functioned as a teacher and assisted with decision-making and diagnosis Student created his own monitoring system
COMPUTER DATA:	Data files on: 1. Education 2. Training 3. Job characteristics 4. User characteristics 5. On-line tests
TERMINAL REQUIREMENTS:	(All under computer control) Cathode ray tube Printer Random access slide projector Tape playback
SYSTEM DESCRIPTION:	ISVD is a direct inquiry system with monitoring which acts on student inquiries and can be reported to anyone who knows how to request reports. ISVD is additionally a teaching and decision-diagnosing and monitoring system which can be made available through a console. The ISVD approaches the condition of a responsive environment in which the student gradually is able to create his own monitoring system which in turn will interact with any new educational, vocational, and/or military decision-making which he cared to make a matter of record for himself in the system.

Prototype I of ISVD was implemented with a small number of students in the fall of 1968. Field testing was planned in 5 locations during 1969. Funding was not continued past this period.

"The Harvard - NEEDS - Newton Information System for Vocational Decisions", Computer-Based Vocational Guidance Systems. Washington, D.C.: U.S. Government Printing Office, 1969, Superintendent of Documents Catalog No. FS 5.255:25053. pp. 128-129.

Tiedeman, David V., "Accommodating Computers Into The Technology of of Guidance", Counselor's Notebook, Vol. 7, No. 3, Nov. 1970.

OIAS

TITLE: Occupational Information Access System

PROJECT DIRECTOR: Bruce McKinlay

PERSON TO CONTACT:

Bruce McKinlay, Director
Occupational Information Access System
University of Oregon
Eugene, Oregon

SYSTEM CHARACTERISTICS:

- Both computer-based and manual system developed
- Interactive with clients
- Client can indicate job preferences and/or requirements
- Computer presents a list of occupations with those characteristics
- Provides occupational information
- Directs client to appropriate sources of occupational information

COMPUTER DATA:

- "Information referral generator" to suggest occupations and refer users to occupational information (207 categories)
- Interview tapes (10-20 occupational areas)
- Description of occupations (up to 250 words)
- Bibliography of occupational information (1 page each)
- Visit referral file (80 occupations -- local)

TERMINAL REQUIREMENTS: Teletype terminal

SYSTEM DESCRIPTION:

The Occupational Information Access System was developed in response to the need to make it easier for people to use the information which is available.

At the system design stage, after specifications had been written it became apparent that a shared-time, remote-terminal computer would be useful for certain aspects of the system, notably the suggestion of occupational areas for exploration, the storage and retrieval of certain information, and the generation of evaluative use data. Computer usage subsequently proved both technically and financially feasible for the model system. Despite the decision to use a computer base, a strictly manual counterpart system was developed concurrently and is also receiving a field test.

The system as designed and tested has five operational components; an "information referral generator" to suggest occupations and to refer users to substantive occupational information, and four "information files" containing or providing access to different types of occupational information presented in different media.

The system is being tested in five pilot agencies: State of Oregon Employment Division, Churchill High School, Lane Community College, University of Oregon Counseling Center, and the State of Oregon Vocational Rehabilitation Division, all of which also served as research sites and provided consultation throughout the project.

McKinlay, Bruce, "Occupational Information Access System: A Model System of Labor Market Information For Use in Counseling", Journal of Educational Data Process, Vol. 7, No. 5, 1970.

PLAN

TITLE: Program for Learning in Accordance with Need

PROJECT DIRECTORS: John C. Flanagan and David V. Tiedeman

PERSON TO CONTACT:
James A. Dunn, Director
Developmental Systems
American Institute for Research
Box 1113
Palo Alto, California

SYSTEM CHARACTERISTICS:
Non-interactive
Provides clerical service for counselor & teacher
Suggests program of study for students
Individualized education
Learner oriented
Uses criterian reference tests to indicate success; ungraded

COMPUTER DATA:
Student scores on project TALENT test battery
Correlations between scores and success and satisfaction in various occupations
Lists of guidance learning units (occupational information)

TERMINAL REQUIREMENTS: None specified

SYSTEM DESCRIPTION: The American Institute for Research Comprehensive Vocational Guidance System is being developed as an independent part of a fully integrated system of individual education entitled Project PLAN. The emphasis throughout Project PLAN is to provide the student with an educational experience in-line with his particular needs seeking to maximize his potential. An essential step in this process is the introduction of guidance materials relevant to the interests of students as they are maturing. Project PLAN includes several school districts in the Palo Alto area. The comprehensive vocational guidance system will be tried out in these schools. The project progressed from an untried idea to operational in 3½ years. System includes 6000 objectives; 2500 teaching/learning units and 12,000 pieces of instructional materials. These five guidance components are included:

1. Orientation to PLAN system, study skills and transition to the world of work,
2. Career information -- ability-based occupational categories by clusters (from TALENT data); the occupations are in families and include: entrance requirements, advancement, and lifestyle,
3. Systematic goal formulation,
4. Student information data bank (test data), and
5. General individualized study.

"The American Institute for Research Comprehensive Vocational Guidance System", Computer-Based Vocational Guidance Systems. Washington, D.C.: U.S. Government Printing Office, 1969, Superintendent of Documents Catalog No. FS 5.225:25053. pp. 135-138.

TITLE:	Rochester Career Guidance Project
PROJECT DIRECTOR:	David B. Youst
PERSON TO CONTACT:	David B. Youst Learning Systems Laboratory Eastman Kodak Company Rochester, New York
SYSTEM CHARACTERISTICS:	Multimedia support system Computer indexing of career information Increased student understanding of work, people, self, and education Increased student vocational maturity
COMPUTER DATA:	Computer application to indexing career information was developed, field tested and phased out due to cost and manpower demands at the computer center
TERMINAL REQUIREMENTS:	None specified at this time
SYSTEM DESCRIPTION:	The Rochester Career Guidance Project, since its inception in September, 1967, has been supported by the New York State Education Department, the Rochester City School District, the Eastman Kodak Company, and the New York State Employment Service.

A major contribution to handling existing information has been the development of a comprehensive microfilm file. All pertinent printed information for each of 623 job titles was first assembled. Included were briefs, the Occupational Outlook Handbook, the Dictionary of Occupational Titles, information from unions, employers, and military services, sample high school programs, names of colleges and schools to get training for this career, names of employees and employers, possible part-time jobs, and other sources of information including career fiction, career bibliography, and audiovisual materials The material in question was then microfilmed in a systematic format for use by individual students who want information about a particular job title, and for modular inclusion into automated guidance information systems. Awaiting the development of new career guidance materials in multimedia form, the micro-image file remains the chief resource in a library-type information system.

New materials were experimentally developed to provide realistic and interesting content in nonprinted form. Life-career studies are slide/audio stories of people at work and at home. Each job is represented by at least three people, one of whom is usually a woman and one a member of a minority group. Each person's history and future aspirations are described to provide a sense of career development throughout life. In addition to providing role models, the materials attempt to convey samples of the kinds of decisions workers are faced with on their jobs. Such materials can be developed on a local basis with amateur efforts -- in fact, often by students themselves.

The question of involving students directly and individualizing guidance exploratory activities are the most exciting aspects of recent project work. A model has been developed and tested which involves individualized on-site exploration of relevant questions on careers generated by students themselves.

Each student visited work sites in the "real" world to help answer his questions. He used photographic and audio media to convey and crystalize his impressions to his peers, and to enlarge an audiovisual data base which other students may then use. The uses of paraprofessional guidance assistance in administering this type of activity have also been investigated.

"The Rochester Career Guidance Project", Computer-Based Vocational Guidance Systems. Washington, D.C.: U.S. Government Printing Office, 1969, Superintendent of Documents Catalog No. FS 5.255:25053. pp. 144-148.

Youst, David B., "Rochester Career Guidance Project", Personnel and Guidance Journal, Vol. 49, No. 3, Nov., 1970, pp. 219-220.

Youst, David B., "The Rochester Career Guidance Project", Educational Technology, Vol. 9, March, 1969, pp. 39-41.

SIGI

TITLE:	System of Interactive Guidance and Information
PROJECT DIRECTOR:	Martin R. Katz
PERSON TO CONTACT:	Martin R. Katz Senior Research Psychologist Educational Testing Service Princeton, New Jersey
SYSTEM CHARACTERISTICS:	Interactive with client Designed for junior college students Designed to help students learn to make career decisions wisely Systematic exploration of values -- now programmed Indicates probability of successful entry into selected occupations Ranks career options based on student input
COMPUTER DATA:	Exploration of values program (a value game using competing values) Value weights assigned by student Options as rated by student Prediction system data (to be done) Planning system data includes simulated problems and outcomes (to be done) Occupational information: 1. 36 done/100 ready/100 on desk 2. Categorized by 10 value 3. Retrieves the five highest rated values but still flexible
TERMINAL REQUIREMENTS:	None specified CRT 720 Note: Present information indicates that this system is still under development
SYSTEM DESCRIPTION:	The Educational Testing Service has developed a computerized System of Interactive Guidance and Information, under a grant from the Carnegie Corporation. A major objective is to help junior college students gain wisdom in career decision-making. It starts by escorting the student through a systematic

exploration of values and the students graphically assign weights to his occupational values. The system provides data on various career options and the student rates these options on its capacity to furnish returns appropriate to each value. In short, this model leads the student to a ranking of options. The system also presents problems in such a way that the student is prepared to anticipate contingencies. The system is ongoing and the student is encouraged to recycle frequently. (Only 2-3 students have used program to date.) Now in use at Jon Muir Jr. H.S., San Jose, California. (Brochure entitled You, Today & Tomorrow is available from Dr. Katz.)

Katz, Martin R., "Career Guidance: Expanding the Student's Decision-Making Power", National Association Secondary School Principals, Bul., Vol. 54: 93-94, May, 1970.

TGISS

TITLE: Total Guidance Information Support System

PROJECT DIRECTOR: None specified

PERSON TO CONTACT: None specified
College High School
Bartlesville, Oklahoma

SYSTEM CHARACTERISTICS: Clerical duty
Interactive with counselor (as of 1970)
Some diagnostic capability
Gaming applications under development
Conversational dialogue under development

COMPUTER DATA: Student data file:

1. General data
2. Health records
3. Work experiences
4. Standard test scores
5. Transcripts
6. Grade point averages
7. Absence records
8. Interests/preferences/honors
9. Health profiles
10. Current schedules

TERMINAL REQUIREMENTS: Remote video information display terminals -- IBM 2260 printer

SYSTEM DESCRIPTION: "The Total Guidance Information Support System (TGISS) is an integrated computer support system designed to facilitate the function of the counselor in helping the student make decisions. The system provides pertinent information for this task through the application of high-speed information retrieval, gaming, diagnostic, and conversational dialogue techniques. The information retrieval system is specifically designed to meet the needs and requirements of the counselors in the Bartlesville, Oklahoma, Public School environment."

Roberts, Tommy L., Clinical Psychologist, "Total Guidance Information Support System", Personnel and Guidance Journal, Vol. 49, No. 3, Nov., 1970, p. 194.

VIEW

TITLE:	Vital Information for Education and Work
PROJECT DIRECTOR:	Dr. Edwin Whitfield
PERSON TO CONTACT:	Dr. Edwin Whitfield Regional Career Information Center Department of Education, San Diego County 6401 Linda Vista Road San Diego, California 92111
SYSTEM CHARACTERISTICS:	Contains microfilmed information on a data aperture card Data cards are computer produced Students don't interact with computer Job descriptions contain local and state information
COMPUTER DATA:	Data recorded on aperture cards: 1. Availability of jobs 2. Opportunities for advancement 3. Earnings 4. School and training programs 5. Requirements of the job 6. Listing of addresses for more information 7. Related occupations
TERMINAL REQUIREMENTS:	None specified Computerized aperture cards Microfiche reader and printer needed
SYSTEM DESCRIPTION:	The VIEW system works on occupational information and its dissemination. The development of another system in New York titled Vocational Guidance in Education (VOGUE), "A Demonstration System of Occupational Information for Career Guidance" was influenced by VIEW. The three methods established for disseminating the occupationals guides are: (1) microfilm reader, (2) microfilm reader-printer, and (3) loose-leaf booklet. For the microfilm reader and reader-printer one aperture card is prepared for each occupation. The student or counselor may scan and read

on the microfilm reader screen the information contained in the card. On the reader-printer the student or counselor may make a print of any or all pages of the information by pressing a button that activates an electrochemical method of enlarging or "blowing back" microfilm images onto paper (2).

Occupational titles of special significance were selected by the following criteria:

1. Shortage of personnel and/or heavy demand occupations,
2. Occupations in which there was activity in the Employment Service,
3. Occupations in which there was interest by Employment Service clients,
4. Occupations for which education was provided locally, and
5. Entry occupations for local high school and two-year college graduates and those who leave school.

Employing these criteria, a total of 212 special occupations were selected for use in the New York VOGUE System.

At the present time both the VIEW system and VOGUE are in use in a number of sites in the country.

Dubato, George S., "VOGUE-A Demonstration System of Occupational Information for Career Guidance", Vocational Guidance Quarterly, Vol. 17, No. 2, 1968, pp. 117-119.

"Project VIEW", Pamphlet, Career Information Center, Dept. of Education, San Diego County, 6401 Linda Vista Road, San Diego, California 92111.

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Cogswell, J. F. and others; "Exploratory Study of Information--Processing Procedures and Computer-Based Technology in Vocational Counseling," (System Development Corporation) California, October, 1967. ED017710

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CVIS Team, "Willowbrook High School Select-A-Course Script", Illinois, October, 1970.

Dubato, G. S. "Vogue: A Demonstration System on Occupational Information for Career Guidance" Vocational Guidance Quarterly, Vol. 17 (2), 117-119, 1968.

Dunn, James A., Dir., Developmental Systems, American Institutes for Research, "The Guidance Program in Project PLAN" Personnel and Guidance Journal, Vol. 49, No. 3, 232, November, 1970.

Estavan, D. P., and others; "Implementation of Vocational Counseling System, and Computer Prediction and Counselor Prediction", (System Development Corporation) California, September, 1969. ED042035

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Harris, JoAnn E. "Can Computers Counsel?" Vocational Guidance Quarterly, Vol. 18, No. 3, pp. 162-4, March, 1970.

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APPENDIX B

EFFECTIVENESS OF MEDIATED CAREER INFORMATION PROGRAMS

Presented to the

AMERICAN VOCATIONAL ASSOCIATION RESEARCH AND EVALUATION DEPARTMENT

at

Portland, Oregon, December 6, 1971

by

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Results from North Central Regional Experiment Station Project NC-86, Nebraska Project Nr. 24-6, in cooperation with EDUTEK, Inc.

EFFECTIVENESS OF MEDIATED CAREER INFORMATION PROGRAMS

Introduction

You need no reminder that the choice of an occupation is one of the most crucial decisions one makes. It has been said that, "To choose a vocation is actually to choose a way of life."[30] The complexities of modern society render obsolete the socialization process of progressing from childhood into the work force. With the passing of guilds, farms and small home-centered businesses, youth have limited contact with the world of work. Lack of knowledge about occupations result in distorted aspirations, attitudes, and concepts of worker role models.

Occupational information subsumes an important role in the process of occupational choice. Although decisions of career choice and preparation are complex, the base of wise choice lies in knowledge about occupations. Intelligent choices require accurate information about what jobs are available, what their requirements are, and what they offer.

Rationale

A comprehensive review of the occupational information available reveals that most of it is grossly inadequate, in form and in its appraisal of the actual situation. Little theoretical base is provided in support of its value. Many jobs are inadequately represented--if at all. Not only is much of the occupational information inadequate or unrealistic, most is in the form of printed materials and uninspiring, such as the Occupational Outlook Handbook.[36] Many of these materials are written at too difficult a reading level, particularly for junior high students. It then becomes necessary to provide occupational information in a form that is more palatable to students.

Although there are numberous films, filmstrips, slides, and audio tapes available from commercial sources, almost all are inadequate in presenting the world of work accurately and realistically.

Related Research

A comprehensive review of related research reflects that:

1. Many factors affect occupational choices of youth.
2. Significant other people affect occupational choices of youth.
3. Occupational information affects occupational choices of youth.
4. Sources of occupational information are important.
5. Adequacy of occupational information is important.
6. Timing of occupational information is important.
7. Audio-visual presentations are effective.
8. Slide-tape presentations have special advantages.

1. MANY FACTORS AFFECT OCCUPATIONAL CHOICES OF YOUTH. Theorists in occupational decision-making, Ginzberg,[13] Super,[34] Havighurst,[16] Caplow,[6] and others generally agree that:

   a. The selection of an occupation is not a sudden, once-in-a-lifetime phenomenon. Instead, it is a gradual process which usually takes place over a number of years.

   b. Occupational choice is part of the basic life process from childhood to adulthood.

   c. As the child advances from early childhood to adolescence, his occupational choices tend to become more realistic.

   d. Occupational choice is influenced by many factors, such as family, peers, work role models, and socio-economic background.

   e. Occupational choice is influenced partially by knowledge of the world of work which is reflected by the occupational information available.

2. SIGNIFICANT OTHER PEOPLE AFFECT OCCUPATIONAL CHOICES OF YOUTH.

In the theory advanced by Roe,[82] vocational choice is based on needs. The need for self-esteem and respect of other people can be satisfied in part by an occupation.

Another basic component of Roe's theory is patterns of early experiences with one or both parents. These experiences may affect future vocational choice.

Krippner conducted a study to determine the relationship between junior high school students' vocational preferences and their parents' occupational levels. The results indicated that the fathers' occupational levels were significantly related to both their daughters' and their sons' job preferences. In addition, the fathers' suggestions as to a career for their sons seemed to follow an orderly progression pattern. At all occupational strata, except the highest, the fathers suggest careers that would boost their sons slightly above their own job levels.[26] Seventy-seven per cent of the students included in the study by Uzzell indicated that their choices were influenced by models. Occupational aspirations were also influenced by mass media and persons in occupations other than those of the student's choice.[37]

Day conducted a study to assess the impact of teacher influence on student's occupational choice. He found that 44 per cent of the high school seniors included in his study reported some influence by a teacher on their occupational preference.[8]

3. OCCUPATIONAL INFORMATION AFFECTS OCCUPATIONAL CHOICES OF YOUTH.

There is no overabundance of research which deals specifically with the effects of occupational information on the occupational choices of youth. However, all decisions are, at least to some extent, based on information or misinformation.[18]

Uzzell found a definite relationship between occupational aspirations and knowledge of occupational models.[37]

Holland sets forth the following hypotheses regarding vocational choice:

> "1. Persons with more information about occupational environments make more adequate choices than do persons with less information.
>
> "2. Adequacy of choice is in part a function of age, since time alone provides more learning opportunities for the accumulation of information.
>
> "3. Persons with more adequate choices will exhibit greater differentiation and organization of occupational knowledge than will persons with less adequate choices.
>
> "4. The amount of occupational knowledge will be positively correlated with the person's developmental hierarchy; that is, the person will know more about the occupations heading his hierarchy than he will about occupations at the bottom of the hierarchy."[20]

To the extent that all of these hypotheses prove to be accurate, it is apparent that young persons could be assisted in making wiser occupational decisions if they utilized accurate, realistic occupational information.

4. SOURCES OF OCCUPATIONAL INFORMATION ARE IMPORTANT.

It is often difficult to obtain occupational information from an original source due to a reluctance to be interviewed or persons employed in a particular job may not be readily accessible. Despite the difficulties, an original source is often the best and sometimes the only source from which to seek the desired information.

Day's data indicate that 60 percent of those students who selected an occupation requiring college training were influenced by teachers, compared to 34 percent of those who selected occupations requiring trade school training and 20 percent of that group who selected occupations requiring no formal training.[9] This study reinforced the findings of other studies which report that teachers have a greater knowledge of professional and white collar occupations than they do of technical, skilled, or lower level jobs.

A study recently completed in Connecticut attempted to ascertain the media and procedures used for orienting junior high school students to occupations and the opportunities to prepare for occupations. In response to a questionnaire, 43 percent of the eighth grade students indicated that they had never discussed occupational or educational plans with their counselor. Forty-eight percent indicated that they had never received any information from counselors relative to jobs in which they were interested. Seventy percent of the eighth grade students had never had a person from business or industry speak to their class about job opportunities. Fifty-six percent indicated that they had never received any formal class instruction related to jobs or occupations. Eighty-one percent had never visited a business or industrial firm for the purpose of studying jobs. A majority of the eighth grade students indicated that they were aware of audio-visual and printed occupational materials which were available; however, 62 percent did not know where to find these materials in the library.[11]

Hoppock and Hoppock reviewed a file of occupational briefs and found that nearly every current brief was based on previously written materials. Often these materials had been written 10 to 30 years earlier. In some cases the later editions merely parroted the original, except for a later copyright date.[21]

5. ADEQUACY OF OCCUPATIONAL INFORMATION IS IMPORTANT.

The readability or reading level of occupational information materials is an important consideration. Quite often printed materials are written at too difficult a reading level for a vast majority of the intended clientele. Ruth assessed the readability of 120 pieces of literature using the Farr-Jenkins-Patterson simplification of the 1948 Flesch reading index.[33] Reading ease grade levels ranged from ninth grade to sixteenth plus. The mean grade level rating of the materials was 14.7. Only one item was considered written to be easily read. Most items were closer in their readability to that of professional journals. Watson, Rundquist, and Cottle reviewed occupational information references and found that 67 percent of those analyzed were readable only at the college reading level or higher.[39] DeBlassie and Jones attempted to compile a listing of sources of occupational information materials appropriate for use with junior high school students. The authors concluded that in spite of the need, most publications currently available are designed primarily for senior high school or post-high school students.[10]

Another area of concern is the range of occupations covered by the career information. In order to meet the varied needs of students, occupational information should be available for a wide range of occupations, since products of the school enter all segments of the total labor structure.

There is a notable lack of information available about jobs at the lower skill levels. Brayfield and Mickelson classified 5,958 occupational references and found that 70 per cent dealt with white collar occupations. Manual or minimal skill level jobs, which provide many of the entry level jobs, were sadly neglected.[4] Teachers tend to know more about professional, clerical, and sales jobs than jobs in other areas.[27] Very few sources of occupational information make any attempt to acquaint students with occupations at all skill levels or at all prestige levels.

In order for any program which prepares students for the world of work to be effective, the counselors or teachers should have the latest information about: (a) social and economic trends of the job market; (b) occupations which have the greatest demand for workers; (c) employment security; (d) opportunity for advancement; (e) the range of jobs available; (f) occupational hazards; and (g) opportunities for training beyond high school.[25] Herr recommends that if career information is to be meaningful to students, it must be structured in terms of the questions students are asking themselves and in a format which is suitable to the language system, readiness level, and stage of development at which they are located. To be effective, career information should include not only objective factors like earning possibility, training requirements, and numbers of positions available, but also the social and psychological conditions in which the work activity is performed.[17] In addition, students must be afforded the opportunity to examine a wide range of occupational opportunities.[17]

Haller and Woelfel have identified many factors which are important to persons in relation to occupations, education, and self. These factors are labeled as "filters." Because of the large number of filters which emerged, the authors have identified four categories into which almost all of the occupational filters seemed easily placeable: Intrinsic Nature, Extrinsic Nature, Intrinsic Function, and Extrinsic Function.[14]

The four filter categories are briefly explained as follows:

"1. Intrinsic Nature (kind of work): This category includes all of those activities which contribute directly to the work of a particular job.

"2. Extrinsic Nature (working conditions): This category is made up of those factors which describe the environments in which the direct work activities occur.

"3. Intrinsic Function (purpose of a job): This category describes the actual reason for a job's existence.

"4. Extrinsic Function (benefits of a job): This category refers to those functions which are not inherently part of a job but which can be served by almost any job."

The filter categories resulted from grouping together all of the filters identified by students on a questionnaire administered by Haller and Woelfel. Since the filter categories are direct result of student responses, occupational information materials should incorporate the necessary information regarding each of the filter categories.

6. TIMING OF OCCUPATIONAL INFORMATION IS IMPORTANT.

Although theories of occupational choice imply that realistic occupational information should be included at several leveis of the developmental process, it appears that the very nature of the junior high school student dictates the importance of providing him with information which he can use as a basis for planning his educational and occupational career.

Most theories identify the period of age 11 to age 14 as a time of interest or exploration with respect to occupational choice. Since this is the age group of the majority of junior high school students, it is extremely important that information on a wide array of occupations be made available to students at this stage of the educational process.

Ginzberg found that the process of occupational decision-making could be analyzed in terms of three periods--fantasy choices (before age 11); tentative choices (between ages 11 and 17); and realistic choices (between 17 and young adulthood).[13]

Campbell _et_. _al_. suggest that although the career choice process is not completely irreversible during the junior high school years, it is clearly a time of significance and has major consequences for the student's future plans. Since nearly all students must make a decision concerning their educational plans for senior high school, being well informed as a decision-maker is crucial. In fact, the choice of, or interest in, an occupation could have a definite influence on future educational planning. Occupational guidance at this educational level can concentrate on a career-oriented exploratory process without premature and unrealistic pressure to make a specific occupational selection.[5]

Bottoms and Matheny suggest that in the junior high school the objective should be to expose all students to the full range of occupations available, knowledge of the satisfactions, dissatisfactions, and requirements of each occupation. The junior high school (grades 7, 8, and 9) should provide activities and experiences which would enhance greatly both the quality and scope of self-understanding in relation to the world of work. The students would have an opportunity to see the relationship between educational avenues and career opportunities.[3]

The provision of occupational information at the junior high school, or middle school, is a legitimate function of the school. Popper indicates that one of the functions of the guidance program in the middle school is to provide guidance for vocational aspirations in the world of work.[31] Van Till, Vars,and Lounsbury allege the purpose of the junior high school is to counsel and provide exploratory work to discover the interests, abilities, and capabilities of individual students. The curriculum must also provide prevocational training, orientation and exploration.[38] Bossing and Cramer suggest that one objective of the junior high school is to initiate a clear understanding of the industry and culture of the adult world.[2]

7. AUDIO-VISUAL OCCUPATIONAL INFORMATION PRESENTATIONS ARE EFFECTIVE.

Suffice it to say, most researchers of this topic concur with Davis that "research findings leave little doubt concerning the contribution of audio-visual materials to learning efficiency."[8]

8. SLIDE-TAPE PRESENTATIONS HAVE SPECIAL ADVANTAGES.

There were few studies in the literature reviewed by the investigators which analyzed the effectiveness of audio-visual methods of presenting occupational information to students. There was even less research evidence to be found that dealt with occupational information presented via 35mm slides and audio tapes. However, the research tends to support the use of audio-visual resources as a means of imparting information to students. In addition, 35mm slides and audio tapes appear to be as effective as other types of media.

In their text on instructional media, Rossi and Biddle indicate that a combination slide-tape presentation affords several instructional advantages over other types of media. First, it utilizes equipment that is in keeping with the trend towards simplicity. Second, this type of media is flexible. It is easily adapted to classroom or individualized instruction. Third, slides and tapes have been shown to be an effective method of presenting information to enhance instruction.[1]

Factors to consider when developing audio-visual materials are the cost of production and flexibility. Lumsdaine reported that although cost can be an important factor with motion picture films, a great degree of flexibility is also lost. The pacing or timing of the instructional materials cannot normally be guided by the reactions of the individual learner. This,however, is not considered a disadvantage if used only with large groups.[28]

The equipment and professional expertise necessary to produce a quality product is also an important consideration. Much less sophisticated equipment is needed to produce slides and tapes than to produce a 16mm film or a video tape. A course offered at New York University afforded teachers an opportunity to develop mediated segments where they focused on some aspect of teaching. The form of media which was used most often, to convey what the teachers wanted to show, was a combination of 35mm slides and audio tapes.[29]

Lumsdaine found that instructional effectiveness similar to 16mm films can be obtained by a sound-accompanied series of projected pictures. A 16mm film was "storyboarded" and put on a filmstrip accompanied by a narrative script. When the filmstrip was compared with the completed film, it was found that those persons who had been subjected to the filmstrip-script learned the main principles contained in the film as well as those persons that viewed the film.[28] Carey found that learning via script-slide (audio-visual) was significantly higher than when the script (audio) was used alone.[7]

One of the primary advantages of providing occupational information via slides and tapes is that it affords an opportunity to bring the business or industry into the classroom. In rural areas direct contact with certain types of occupations is impossible; therefore, the importance of providing indirect contact through occupational information becomes even more obvious and important.[22] Miller compared viewing a vocational film with making an actual job visit. He concluded that although students learn about occupations and jobs when either method is used, those who visited on the job showed higher gains in occupational information, selection of careers, and stability of occupational choice.[29] However, for those students located in communities where it is not feasible to visit the actual job site, other methods may have to be employed. Goldsbury conducted a feasibility study of local field trips taken vicariously through slides and tapes. He compared the following methods: (1) field trips; (2) slides and tapes of field trips; and (3) slides and tapes and field trips both. The students were evaluated on the basis of facts, concepts, and attitudes. Analysis of evaluative data indicated that the combination of actual field trips plus slides and tapes was the most effective approach to field trip experiences. The instructional method of remaining in the classroom and taking the field trip vicariously through slides and tapes proved more effective than direct exposure to field trip experiences.[12]

In summary, the literature seems to indicate a definite need to place more emphasis on assisting young people in making more appropriate occupational choices, particularly at the junior high school level. There is an expressed need to provide accurate, realistic sources of occupational information in forms other than printed materials. Based on the research conducted using slides and audio tapes, it appears that this is an appropriate method for providing occupational information.

Problem

There is an urgent need for increased emphasis on realistic orientation to the changing world of work. The specific problem was to: (1) develop and mediate accurate realistic occupational information, (2) field test (implement) the mediated career information programs, and (3) collect and analyze data to evaluate the effects of occupational guidance materials toward modifications of aspirations, attitudes, and knowledge about the world of work. A variety of approaches and a range of age groups were tested.

Procedures

Development and mediation of career information programs.

Phase I -

The first step in developing the occupational information materials used in the study was to select the occupations to be represented. The decision was made to develop materials on 100 occupations. (Listed in Appendix A.) The committee of the North Central Regional Experiment Station Project NC-86 used the North-Hatt Prestige Scale[19] and Haller's "Occupational Aspiration Scale"[15] as a basis for selecting occupations. In addition, it was decided that all regular vocational areas would be included (i.e., agriculture; home economics; distribution; trade and industrial; office; and health.) A range of prestige levels were included in each vocational area.

The next step was to identify the nature of and collect the occupational information that should be gathered on each occupation. A series of interview questions (Appendix B) was developed in order that standard information could be obtained for every occupation. The questions were based on what students want and need to know about a job.[14]

Interviews were conducted with persons employed in each of the selected occupations, photographs were then taken of persons on the job. The result was a series of 100 five-minute programs on 35mm slides and audio tapes.

Illustrate the Mediated Career Information Programs. Note content of standardized interview questions.

Field Test (Implementation) of the Mediated Career Information Programs. The following pilot studies, mini- and quasi-experiments were conducted:

Phase II -

1. A Pilot Evaluation of Mediated Career Information With Composite Age Groups.
2. Evaluation of Mediated Career Information With Eighth Grade Students.
3. Evaluation of Mediated Career Information With High School Sophomores.

4. Evaluation of Mediated Career Information With Culturally Deprived Youth (17-22 years of age).

5. Evaluation of Mediated Career Information With Post-Secondary Students.

6. Evaluation of Mediated Career Information With Adults Who were Significant Others to Eighth Grade Students.

Design and Instrumentation

The single-group pre-test, treatment and post-test as well as the two-group (experimental and control) post-test only designs were used.

Several data gathering instruments were used in an attempt to assess the effect of the mediated career information materials on both youth and adults. The instrument used to measure knowledge of occupations was developed by the project staff. The items for the "Test on Knowledge of Occupations" was based on four occupational filter categories identified by Haller and Woelfel[14] and the data, people and things functions of jobs identified in the Dictionary of Occupational Titles.[35] This resulted in seven different items for each of the 100 occupations, or a total of 700 possible items from which to select. In order to reduce the length of the test, a total of 200 items were randomly selected from the 700 original items. The test was then piloted, item analyzed, and revised. As a result of the item analysis, the best 160 items were selected. By applying the technique of matrix sampling[23] these 160 items were randomly assigned to five sub-tests of 32 items each.

Haller's "Occupational Aspiration Scale"[15] was used to measure students' level of occupational aspiration. This instrument was selected because it is practicable and reliable and is easily administered and scored.

The instrument used to measure the students' attitutde toward work was the "Opinions About Work" scale developed by the Rocky Mountain Educational Laboratory.[24] This instrument appeared to be as reliable and valid as other opinionnaires or attitude scales, and it is written at an appropriate reading level for eighth grade students.

A subjective evaluation instrument was developed by the project staff for use by students to permit them to provide feedback on the mediated career information materials. This instrument was administered at the conclusion of the experiment.

Date Analysis Evaluation of the Mediated Career Information (MCI) Programs was accomplished by examining the modification of knowledge, aspirations, and attitudes of participants with regard to the world of work as follows:

Phase III-

Title: A Pilot Evaluation of Mediated Career Information (MCI) With Composite Age Groups and Education Levels.

Purpose: To evaluate the Mediated Career Information materials and experimental procedures with a range of clientele.

Method: A cross section of age groups was recruited. This included fifty individuals whose educational levels were kindergarten through Ph.D. Forty-two persons viewed all of the Mediated Career Information programs. Approximately 20 hours were required to complete the pre- and post-tests and view the material on all 100 occupations.

Findings: The results were limited and only tentative observations can be made from these data. They supported our expectations concerning modification of occupational aspiration. We expected that some change would occur regardless of the direction of that change. We concluded from this Pilot evaluation of the experimental procedure that we should: (a) revise the "Test on Knowledge of Occupations"; (b) examine the practical minimum age limit for the pre- and post-tests (required about third grade reading level); (c) accept the general format for a wide range of age groups; (d) provide discussion time after viewing each program; and, (e) solicit subjective evaluations after each presentation. Favorable subjective evaluations were obtained.

TABLE I

Modification of Scores on "Test on Knowledge of Occupations" by Mediated Career Information

Group	Number	T_1 Mean	Modifications of Average Scores
Elementary	18	11.72	+3.44
Junior High	7	17.85	+0.15
Senior High	8	22.62	-0.25
Adults	9	23.22	-0.22

TABLE II

Modification of Occupational Aspiration Scores as a Result of Mediated Career Information

Group	Number	T_1 Mean	Percentage Changes
Elementary	18	40.50	23.16
Junior High	7	43.28	13.51
Senior High	8	50.25	7.70
Adult	9	41.77	19.15

TABLE III

Modification of Scores on "Work Opinions Test"
by Mediated Career Information

Group	Number	T_1 Mean	Modifications of Average Scores
Elementary	18	153.38	+0.28
Junior High	7	166.57	+2.00
Senior High	8	171.25	-2.63
Adult	9	180.00	+3.22

Title: Evaluation of Mediated Career Information (MCI) on the Aspirations, Understandings, and Attitudes of Eighth Grade Students.

Purpose: The purpose of this study was to compare the effectiveness of Mediated Career Information (MCI) in the form of synchronized 35mm slides and audio tapes as contrasted to the traditional guidance program for eighth grade students.

Method: The study involved 279 eighth grade students enrolled in Robin Mickle Junior High School, Lincoln, Nebraska. The students were randomly assigned to classes prior to the experiment. The experimental treatment was assigned to one class for each of the three guidance counselors cooperating with the investigator. The remaining two classes for each of the guidance counselors were assigned to the control group. The experimental treatment group consisted of 90 students, and the control group was composed of 180 students. The study was a quasi-experimental non-equivalent control group design. The experiment was conducted during the second semester of the 1970-1971 school year.

The students in the experimental groups were shown the slides and audio tapes on 100 different occupations. The students in the control groups received occupational information via various media in their regular group guidance class.

The null hypotheses regarding knowledge and aspiration level were tested using the analysis of variance with unweighted means to accommodate the unequal class sizes. The analysis of covariance was used to test the null hypothesis for attitude toward work. The pre-test scores on "Opinions About Work" were used as the covariate. Comparisons were made to determine the relationships between the experimental and control groups regarding student personal data. The opinions of students were assessed on a subjective evaluation instrument regarding the experimental program.

Findings: The data presented in the study showed no significant differences between the experimental and control groups on the basis of the "Test on Knowledge of Occupations" and the "Occupational Aspiration Scale." Thus, the null hypotheses could not be rejected.

The dependent variable used to test the null hypothesis regarding student's attitude toward work was the post-test scores on "Opinions About Work." The F ratios for the effect of mediated instruction and the effect of the individual teacher did not exceed the established critical values. However, the F ratio for the effect of the individual teacher by treatment was significant at the .05 level. Thus, the data indicate that a combination of the effect of mediated instruction and the individual teacher had more influence on student's attitude toward work than either the effect of mediated instruction or the individual teacher effect alone.

At the conclusion of the study students in the experimental treatment group were afforded the opportunity to provide feedback on a subjective evaluation instrument. The results of the evaluation indicated that the students generally had a favorable attitude toward the experimental program although a majority of the students did indicate that they would prefer to learn about jobs by talking directly to someone who had a job in which they were interested or by going on a school sponsored field trip to visit a business.

The scores on all three measures obtained by the experimental group exceeded those obtained by a non-equivalent control group from another school in the Lincoln System. (See Table IV)

The evidence from this study suggests that the occupational information provided solely by slides and tapes is at least as effective as the occupational phase of the group guidance program using a wide variety of audio-visual materials, class discussion, and a required paper on a selected career, and generally considered to be an excellent program.

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TABLE IV

Comparative Scores of Eighth Grade Students on Tests of Knowledge, Aspiration, and Work Opinions With and Without Mediated Career Information

(Non-equivalent, pre-existing groups)

Test Area	Mean Scores Control Group	Mean Scores Experimental Group (MCI)
Knowledge	12.79	15.74
Aspiration	37.72	41.58
Opinions	131.64	144.99

Title: Evaluation of Mediated Career Information (MCI) on Aspiration, Understandings, and Attitudes of High School Sophomores.

Purpose: The purpose of this study was to compare the effectiveness of occupational information in the form of synchronized 35mm slides and audio tapes on high school sophomores.

Method: The experiment was conducted utilizing sophomores in guidance classes at Lincoln High School. Two hundred fifty-three sophomores were divided randomly into two groups, by guidance classes, 121 in the control group and 132 in the experimental group. The test was administered to the control group as a pre-test. Then they were shown eight interveiw presentations via tapes and slides. The interviews were with people who were employed as electronics technologists, draftsmen, dental assistants, nurses' aides, accountants, secretaries, T.V. repairmen, and file clerks. The experimental group was shown the eight on-the-job interviews via tapes and slides then given the same 20 questions as a post-test.

Findings: When compared, the experimental group had higher knowledge scores, significant at the .001 level of confidence. Also, the aspiration level was significantly higher at the .01 level of confidence. No differences were observed in scores on opinions between the two groups (See Table V). This age group was attentive and some individuals asked for an extension of the activity.

TABLE V

Differences Between Knowledge, Aspiration and Opinion Test Scores of Sophomores With and Without Mediated Career Information

Test Area	"t" Test Results
Knowledge	4.812***
Aspiration	2.966**
Opinions	.857 N.S.

*** Significant .001 level, 251 df

** Significant .01 level, 251 df

Title: Evaluation of Mediated Career Information on Aspirations, Understandings, and Attitudes of Culturally Deprived (Chicano) Youth (17-22 Years of Age).

The following explanation is to provide background on the High School Equivalency Program (H.E.P.). H.E.P. is an educational program sponsored by the 1964 Economic Opportunity Act, Section 111B to plan new and creative programs to help migrant and seasonal farm workers improve their employment outlook. This program works with the migrant and seasonal farm worker youth, age 17-22, who are unmarried school dropouts who have indicated a desire to finish their high school education and find progressive full-time employment. They are taken to a University setting--in this case University of Nebraska--where they are treated as college students and given special courses which allow them to complete their high school studies and pass the General Education Development test. They also experience exposure to many college students with divergent academic and vocational goals.

The Nebraska H.E.P. program has been successful in helping students complete their high school education and the exposure to college students help many youth develop goals of a college education. However, the college setting provides little contact with short term technical training programs leading to alternative positions such as draftsman, licensed practical nurse, secretary, mechanic, etc.

Purpose: To make a comparison of concentrated vs. integrated mediated career information programs with deprived (Chicanos).

Method: An orientation program was developed to expose H.E.P. students who possibly have never been exposed to the understanding of jobs, to try and create an understanding of the various job clusters which lead to personal, social and economic goal satisfaction. Objectives were: to become familiar with various job opportunities and to know where and how to search out these opportunities; to be familiar with the requirements demanded by each occupation; to be familiar with the occupational and educational requirements needed to be an effective employee.

The program consisted of six weeks of instruction, discussion, and field exposure. Each week required 11 hours of attendance. The major occupational areas covered were: Trade and Industrial Occupations, Business and Distributive Occupations, Health Related Occupations, and Agricultural Occupations.

Specifically, a mini-experiment was conducted using two groups of H.E.P. students. Group I consisted of 13 students who were presented 100 slide-tape presentations in concentrated two hours per day sessions for ten days. A pre-test (T_1) was administered the first session; another test (T_2) was administered following the last session of the slide-tape presentations. The next four weeks of two hours per day sessions were spent in occupational exploration, discussion, and visitation. Another post-test (T_3) was administered the last day measuring knowledge, aspirations, and opinions of the world of work.

Group II, consisting of nine H.E.P. students, were shown the slide-tape presentations in an integrated fashion, grouped by occupational clusters and included discussion and visitation. A pre-test (T_1) and a post-test (T_2) was administered at the beginning and end of the six-week treatment period.

Findings: A comparison of the data from the tests given Group I shows that a highly significant change occurred in the occupational knowledge, at the .001 level of confidence between T_1 (pre-test) and T_2 (following the concentrated presentations).

Significant change, at .01 level of confidence in occupational knowledge was also found when making a "t" test comparison of T_1 with T_3 (after six weeks). Changes in work opinions approached significance (.10 level) from T_1 to T_3 (See Table VI). Aspiration scores of Group I were higher, though not significantly so after the mediated career information program.

Group II showed evidence of change in aspiration level. The aspirations of the group went down significantly, .05 level. This may reflect a more realistic view by H.E.P. students (See Table VII).

TABLE VI

Differences Between Knowledge, Aspiration and Opinion Pre- and Post-Test Scores of H.E.P. Students With Concentrated Mediated Career Information

Test Area	Tests Compared	df	"t" Test Results
Knowledge	$T_1 - T_2$	11	7.255***
Aspiration	(IMMED	10	1.633 N.S.
Opinion	IATE)	11	1.122 N.S.
Knowledge	$T_1 - T_3$	8	4.535**
Aspiration	(DEL	7	1.276 N.S.
Opinion	AYED)	8	2.234 (.10)

*** Significant at .001 level

** Significant at .01 level

TABLE VII

Differences Between Knowledge, Aspiration and Opinion Pre- and Post-Test Scores of H.E.P. Students With Integrated Mediated Career Information

Test Area	"t" Test Results
Knowledge	.864 N.S.
Aspiration	2.453*
Opinion	.451 N.S.

* Significant at .05 level, 8 df

Comparisons were made between groups. Differences were observed in scores in occupational knowledge, aspiration, opinion. Group I which received the concentrated media presentations in random order for two weeks followed by discussion, speakers and trips, generally showed higher scores than Group II using the integrated approach. When comparing results of the Group I (T_2 at the end of the concentrated presentations) with the T_2 of Group II (integrated) differences in occupational knowledge approached significance (.10 level of confidence). The aspiration level of Group II was lowered during the experience. Work opinions differed very significantly between Group I and Group II, with Group I scores being higher (See Table VIII).

The same pattern in scores between Groups I and II was found when the final tests were administered at the end of the six-week program. The Group I (concentrated MCI) scores were higher in each case. Aspiration level was significantly higher at .05 level of confidence in Group I than Group II. Changes in work were significantly different, .001 level of confidence. (See Table VIII).

TABLE VIII

Differences Between Knowledge, Aspiration and Opinion Test Scores After Concentrated vs. Integrated Mediated Career Information

Test Area	Tests Compared		df	"t" Test Results
	Group I	Group II		
Knowledge	T_2[a]	T_2	19	1.770 N.S.
Aspirations			18	1.335 N.S.
Opinions			19	2.598*
Knowledge	T_3	T_2	17	2.009 (.10)
Aspirations	FIN		17	2.247*
Opinions	ALS		17	4.243***

*** Significant at .001 level

* Significant at .05 level

[a] Post-test for Group I after two-week concentrated MCI. Other T_2's and T_3's given at the end of the six-week program.

These data indicate that the concentrated treatment for Group I produced higher scores in all areas whether the group was tested immediately following the concentrated presentations or four weeks later, following the discussions, tours, and speakers. The instructors explained that tne interest of Group I was easier to maintain because of the random selection and presentation of occupations. When clusters of occupations were shown in Group II, students with little interest in certain occupational families lost interest and diverted their attention. Attendance was much poorer in Group II. Classes were at prime recreational times, 7:00 - 9:00 p.m., so maintaining motivation and interest was a challenge. An evaluation of the total occupational orientation was administered in both groups as a final activity. All indicated enjoying the slides and tapes and learning more about jobs. None preferred reading the information from a textbook. Group I asked for more discussion. Changes in specific job objectives were noted by two-thirds of the Group. Comments from both Group I and Group II were favorable to this activity as an opportunity to learn about occupations of which they were not knowledgeable.

Title: Evaluation of Mediated Career Information on Aspirations, Understandings, and Attitudes of Post-Secondary Students.

Purpose: It was the purpose of this study to measure the modifications in aspirations, knowledge, and attitudes of prospective technical college students via mediated career information programs.

Method: As a part of an orientation procedure, prospective Lincoln, Nebraska, Technical Community College students from 16 to 50 years of age were shown ten on-the-job interviews via slides and tapes. A control group of 49 was given the pre-test on occupational knowledge, aspirations, and opinions in the world of work, then were shown ten slide-tape presentations. The experimental group of 53 was shown the slides and tapes prior to the post-test.

The occupations selected helped to depict the offerings at Lincoln, Nebraska, Technical Community College. Some students were currently in high school, some were dropouts from high school or college. Many were being sponsored by governmental programs as Vocational Rehabilitation, Work Incentive Program, Veterans Administration, Social Security, married, divorced, with families or veterans.

The group of occupations presented consisted of electronics technology, dental assisting, drafting technology, nurse aides, accounting, secretary, TV repairman, registered nurse, key punch operator, and file clerk.

Findings: Comparing the scores between the control group and experimental group yielded no significant differences in knowledge of occupations or in aspirations. Opinions of the world of work held by the experimental group were significantly lower than control group (See Table IX).

TABLE IX

Differences Between Knowledge, Aspiration, and Opinion Test Scores of Post-Secondary Students With and Without Mediated Career Information

Test Area	df	"t" Test Results
Knowledge	101	.468 N.S.
Aspiration	99	.169 N.S.
Opinion	103	3.287**

** Significant at .01 level

The data show little effect was made on the post-secondary student who has decided on a specific program offered by the Technical College. This student was not opposed to viewing these slides and tapes but in some instances was "impatient." Some expressed gratitude for providing this orienting activity.

Title: A Study of the Influence of Mediated Career Information Via Significant Others on Aspirations, Understandings and Attitudes of Eighth Grade Students.

Purpose: The purpose of this study was to evaluate the effectiveness of mediated career information via significant others on occupational aspirations, understandings, and attitudes of eighth grade students.

Method: The study involved 152 eighth grade students enrolled during the spring of 1971 in Goodrich Junior High School, Lincoln, Nebraska. The students were randomly assigned to the treatment groups. There were a total of 55 students in the experimental group and 49 in the control group.

A total of 254 significant others as identified by the experimental group, were contacted by letter and/or phone. They were apprised of their role as significant others and invited to watch 35mm slide and audio tape presentations on 100 different occupations. A total of 41 significant others attended one or more sessions. The total number of contact hours with significant others was 173.5.

Findings: Given the type of materials, the time span, and limited participation on the part of significant others, the results indicate that: (1) Mediated career information via significant others will effect no measurable change on occupational aspirations, understandings, and attitudes of eighth grade students; (2) Mediated career information will cause significant others to expect youth to reach lower prestige level occupations (See Table X); (3) Mediated career information will receive a favorable evaluation by significant others.

TABLE X

Differences Between Occupational Expectation
Pre- and Post-Test Scores of Significant Others
With Mediated Career Information

Test Area	df	"t" Test Results
Occupational Expectation	60	-14.470***

*** Significant at .001 level

Summary

Succinctly, we have conducted a comprehensive review of literature (Bibliography attached), previewed occupational information available, and found a dearth of accurate and realistic materials in a form palatable to most youth. We have, over the past three years, systematically developed mediated career information, slide-tape programs on more than one hundred occupations. We have pilot tested and evaluated the effects of these occupational guidance materials in terms of modifying aspirations, understandings, and attitudes of youth, with regard to the world of work.

Based upon our limited research, we have concluded that these materials are quite acceptable to youth at various age levels, and that they are effective, especially at the junior high and secondary levels and with culturally deprived youth.

It is our hope that in the immediate future we will be able to conduct more extensive and rigorous research and that the refined version of the materials may become available for widespread utilization.

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MEDIATED CAREER INFORMATION MATERIALS

Department of Ag. Ed.
University of Nebraska

(5-7 minute taped interview and 25-35 color slides)

1. Home Economics Occupations

____ Clothes Presser
____ Day Care Center Operator
____ Dietary Aid
____ Dietitian
____ Dishwasher
____ Fashion Designer
____ Interior Designer
____ Laundry Worker
____ Maid
____ Sewing Machine Operator
____ Soda Fountain Clerk
____ Waitress
____ Restaurant Manager

2. Agriculture Occupations

____ Ag. Machine Set Up Man
____ Co. Agricultural Agent
____ Entomologist
____ Farm Hand
____ Horticulturist
____ Tenant Farmer
____ Veterinarian
____ Cattle Buyer
____ Grain Buyer
____ Salesman .... Livestock Feed
____ Feed Mill Worker (sacker)
____ Sales .... Farm Equipment
____ Farm Manager
____ Farm Loan Officer
____ Salesman .... Seed Corn
____ Rural Gas Delivery Man
____ Soil Conservationist
____ Groundskeeper
____ Agricultural News Editor
____ Farm Implement Partsman
____ Vocational Agricultural Teacher
____ Veterinarian Assistant
____ Fertilizer Plant Manager
____ Agricultural Engineer
____ Conservation Officer

3. Technical and Building Construction Trades Occupations

____ Architect
____ Brickmason
____ Building Contractor
____ Building Inspector
____ Cabinet Maker
____ Draftsman
____ Electrician
____ Jeweler
____ Plumber
____ Welder

4. Clerical and Office Occupations

____ Business College Manager
____ File Clerk
____ Finger Print Technician
____ Grocery Clerk
____ Key Punch Operator
____ Mail Carrier
____ Office Manager
____ Secretary
____ Shipping and Receiving Clerk
____ Store Clerk

5. Selling and Business Occupations

____ Auto Dealer
____ Insurance Agent
____ Milk Routeman
____ Owner Advertising Agency
____ Owner of Business
____ Radio and T.V. Time Salesman
____ Supervisor in Retail Store
____ Traveling Salesman

6. Mechanical and Outdoor Occupations

____ Archaeologist
____ Aviation Mechanic
____ Garage Mechanic
____ Garbage Collector
____ Machine Operator
____ Oceanographer
____ Park Ranger
____ Service Station Attendant
____ Telephone Co. Lineman
____ Television Repairman
____ Electronic Technologist

7. Science, Engineering and Mathematic Occupations

____ Accountant
____ Astronaut
____ Chemist
____ Civil Engineer
____ Metallurgist
____ Scientist
____ Space Scientist

8. Health Occupations

____ Dentist
____ Hospital Orderly
____ Medical Lab Technician
____ Nurses Aid
____ Pharmacist
____ Physician
____ Psychologist
____ Registered Nurse
____ Dental Assistant

9. Transportation Occupations

____ Airplane Pilot
____ Dock Worker
____ General Manager, Interstate Shipping
____ Railroad Engineer
____ Taxi Driver
____ Truck Driver

10. Service Occupations

____ Banker
____ Barber
____ College Professor
____ Clergyman
____ Cosmotologist
____ Diplomat
____ Funeral Director
____ Janitor
____ Lawyer
____ Librarian
____ Meat Cutter
____ Policeman
____ Public School Teacher
____ Shoe Shine Boy
____ Sociologist
____ Stock Broker

11. Publishing and Performing Arts Occupations

____ Musician
____ Newspaper Columnist
____ Photographer
____ Proofreader
____ Radio Announcer

INTERVIEW QUESTIONNAIRE

We appreciate very much your cooperation in the occupational education activities which we are conducting at the University of Nebraska Agricultural Education Department. The questions we will ask you are contained on this sheet. You might find it helpful to read them over in organizing your thoughts and responses.

1. Would you please describe your job? What do you do in a typical day?
2. Are there any specific tools or equipment that you use on this job?
3. How many hours per week do you work?
4. Do you have freedom on the job, or are you under close supervision?
5. What interests, physical requirements, and special abilities are helpful to a person working in this area?
6. What is the minimum education or training required for employment in this occupation?
7. In what way do you feel your occupation is important to our total society?
8. How are your opportunities for advancement and what is the employment outlook in your occupation?
9. How do you feel your job compares with other jobs in terms of being able to support a family?
10. How would a person find job openings in your occupation?
11. What are the advantages and disadvantages in this occupation?

THANK YOU VERY MUCH!!!!

APPENDIX C

OUTLINE OF A DIRECTED, INDIVIDUALIZED, MULTI-MEDIA, CAREER GUIDANCE SYSTEM WHICH INTEGRATES COMPUTERIZED INFORMATION AND AUDIO-VISUAL PRESENTATIONS FOR SCHOOL SYSTEMS

Self-Instructional Career Guidance System Model

Institute for Education and Technology
EDUTEK, Incorporated
Ninth and Avenue H
1340 Air Park West
Lincoln, Nebraska 68524

Principal Investigators

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1972

OBJECTIVES:

To develop a system to integrate computerized information and mediated career units requires attention to the following objectives. It is recessary to:

1. Provide career guidance for all students via multi-media and an interactive, computerized, vocational information system.
2. Assist students to select high school courses that will aid them in achieving their career goals.
3. Provide self-assessment activities that encourage tentative choices of occupational clusters.
4. Assist students to develop occupational and educational planning skills.
5. Provide the opportunity for students to improve the quality of their career decisions.
6. Assist students to develop post-high school plans.

PROCEDURES:

Implementation and evaluation of the career guidance system will be accomplished in several demonstration schools. It is intended that the total guidance system be implemented and evaluated in each school; however, the participation of each student in each school may not be feasible due to budgeting and scheduling constraints.

The demonstration schools will be selected by the project investigators. The following criteria will be used to evaluate potential demonstration centers:

1. Willingness to participate.
2. Geographical distribution among the four states served by EDUTEK, Inc. in order to provide demonstration sites close in proximity to educators in the four states.
3. Locations coordinated with other demonstration centers or pilot-career educational programs in operation within the four states as identified by the various State Departments of Education in the four-state area and the Region VII office.
4. Special consideration given to selecting several small school systems in rural areas in order to evaluate the financial feasibility of such a project in small schools.

Steps to be followed in tailoring the system to the needs and programs of demonstration centers will be based on the following considerations:

1. The present career guidance activities of each demonstration school will be inventoried with the assistance of the project staff. This will include:

    a. Self-evaluation of guidance activities.

    b. Preparation of a listing of all vocational education courses offered including course content descriptions.

    c. Preparation of a self-evaluation of career education activities and materials developed for career education.

    d. A survey of instructional and guidance staff to identify career education and occupational experience as well as a willingness to engage in further career guidance activities.

    e. Preparation of a letter of intent indicating the school's willingness and financial ability to continue the career guidance activities resulting from participation as a demonstration site.

    f. Identification of a computer installation with time available and adequate capacity to meet the needs of the computerized aspects of the project.

    g. Identification of facilities within the school for the project site team, computer terminals, printer, etc.

    h. Allocation of media resources for the multi-media aspect of the project.

    i. Preparation of a letter of intent indicating the school administration's interest in computerizing school records, schedules, attendance, etc.

2. Each demonstration center will identify personnel to work with project staff in the integration of the career guidance system. Each site team will make recommendations on the following issues:

    a. The procedure for integrating the inputs of:

(1) The Computerized Vocational Information System (CVIS) staff plan for utilizing the mediated career information materials;

(2) "Introduction to the World of Work", a slide/tape presentation introducing the mediated career information materials;

(3) "Occupational or Job Briefs" prepared by the project staff; and

(4) The career education model and accompanying descriptions of the school-based model developed by the National Center for Vocational Technical Education.

b. The extent to which demonstration school programs subscribe to the computerized aspects of the system may vary from:

(1) Complete CVIS package including all administrative functions and vocational information;

(2) Vocational information aspects only of CVIS;

(3) Other computerized systems such as Interactive Learning System; or

(4) No computer involvement.

c. The mediated units of the system may be applied in the following ways:

(1) All students have free access to all programs.

(2) All students are required to view each program.

(3) Selected students have free access to all programs.

(4) Selected students have free access to selected programs.

(5) Selected students are required to view each program.

(6) All students have free access to related programs.

(7) All students are required to view selected programs.

   d. A plan for the orientation of administration, teachers, students, and parents must be developed.

3. Each demonstration center will conduct evaluation and feedback activities to assess the system's effectiveness. The activities require the application of instruments to measure attitude, achievement, aspiration and interest levels. These instruments include:

   a. "Opinions About Work" (Rocky Mountain Regional Laboratory)

   b. "Work Opinion Inventory" (Dr. Donald Super)

   c. Teacher made tests and surveys

   d. A student opinionnaire

   e. A teacher opinionnaire

   f. "Knowledge of Occupations" (Zikmund, Douglass and Horner)

   g. Teacher constructed tests

   h. Self-report

   i. "Occupation Aspiration Scale" (Dr. A. O. Haller)

   j. "Kuder Occupational Preference Test"

   k. "Expectation Scale -- Teachers" (Dr. A. O. Haller)

   l. "Expectation Scale -- Significant Others" (Dr. A. O. Haller)

   m. Ohio Vocational Interest Survey

   n. Teacher constructed interest scales

4. The site team will collect and analyze data related to the following cost factors:

   a. System, planning, evaluation and management

b. Staffing patterns

c. Software selection, production, storage, retrieval and display

d. Space

e. Hardware

440/441

PROJECT 8

READING CENTER DEVELOPMENT

PROJECT PERIOD
July 1, 1971 - June 30, 1972

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PROJECT #8

ANNUAL REPORT

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I. Problem:

Reading is both a complex process and a learned skill. Thousands of studies have been reported on this topic in research literature. Yet, until just a few years ago, teachers were not required to have a course in teaching of this most complex skill as a part of their professional training. Therefore, the state of the art of teaching reading in the average classroom lags far behind the ideal.

While the modern concept of the "ideal" in teaching reading might be considered by some as "individualized" or by others as the traditional three reading-group set-up in the classroom, nevertheless, a great deal of whole-group teaching is still occurring. And, the cookbook approach is in wide use. The "cookbook approach" is thought of as the slavish adherence to the teacher's manual prescribing the ingredients of the reading lesson for the day--the emphasis on "presenting" the lesson to the whole group, leading the whole group through each part of the lesson in a lock-step fashion.

There are students in every group for whom this approach is not adequate;therefore, they do not make satisfactory progress in learning to read. The slow learners, the immature, the emotionally involved, neurologically impaired, and the culturally disadvantaged are some of those who have been found not making satisfactory progress in reading under the "cookbook" teaching approach in the classroom.

Often in these situations it is found that the teacher is powerless to help the pupil who is in trouble in reading even if she is favorably disposed to do so. The reason the teacher cannot help is often that she does not have the knowledge or the material at hand to help the pupil.

In this project, an attempt is being made to assist the classroom teacher in the following specific ways:

A. Pinpoint the nature of the reading problem of any pupil the teacher wishes to designate.

B. Pinpoint the specific teaching procedures and materials to be used in correcting his reading problem in the classroom setting.

Diagnostic tests, remedial reading procedures, and appropriate instructional materials for use with specific types of pupils are available. By utilizing a computer-based storage and retrieval system, teachers who desire to help pupils in their classes with reading will be given precise diagnostic information, teaching instruction, and appropriate materials to do the job.

II. Purpose:

It is felt that, if found to be feasible, this approach has the great advantage of providing the necessary help for the classroom teacher at the contact point--the pupil in the classroom. The more widely used method of helping the teacher cope with this problem is to conduct in-service workshops on reading or to encourage her to take graduate work in the reading area. In neither case does the teacher obtain help from the outside at the contact point.

By linking the diagnostic information on the pupil with the specific teaching procedures and reading materials needed for implementation, great precision in the classroom remediation of pupils' reading problems can be achieved. By this it is meant that the teacher can be guided to teach the pupil what he needs to learn, at the proper level, without wasting time on the skills he has already mastered.

Another advantage of this procedure is its economy when compared with traditional approaches to remedial reading. Normally, a specially trained teacher is employed and students are sent to her for their remediation lessons in reading. In this procedure, only pupils the teacher designates receive the remediation and the hiring of especially trained personnel by the school district is not required.

Frequently, when a pupil is singled out by the classroom teacher as a problem and is subsequently sent away from the classroom to another teacher to "remedial reading," it is perceived as a sign of defeat both by the classroom teacher and by the pupil. It is to be anticipated that a computerized diagnostic-prescriptive procedure will yield dividends in heightened morale on the part of the classroom teacher because she now will have the power to help her pupil; and on the pupil's part because he is no longer singled out and sent away because he is, by his reckoning, "too dumb to learn to read". There is the more subtle, no less real, influence of the classroom teacher's self-reliance versus the perceived threat of the reading specialist. If the classroom teacher can be convinced that she is capable of solving her own problems, the total quality of the public school program can be expected to improve.

Furthermore, there is the potential in this system of engaging the classroom teacher as a kind of "manager" of the learning enterprise. That is, if the teacher is successful using the technology as suggested herein, then the role of the teacher may gradually change, by her own efforts from the present image of "Our Miss Brooks" to one which would be better described as "Manager of the Learning Environment." This could lead, rather quickly, to the acceptance and useful employment of para-professionals and teacher-aides in the classroom.

III. Project Plan:

The overall Project Plan has been to design a computer-based storage and retrieval system for providing the classroom teacher and/or reading specialist with diagnostic information, instruction, and materials for precision teaching of reading for selected pupils in the classroom.

PHASE I PROJECTION (YEAR I)-DESIGN SYSTEM PARAMETERS

Step I Select and Construct a Reading Diagnostic Test Battery.

From the following categories of reading and skill tests, certain measures of reading performance have have been selected. These include portions of tests, certain items or item types and/or new constructions.

A. Reading Test:

General Achievement--Standarized--Group
Diagnostic--Standardized--Group
Diagnostic--Non-standard--Individual
Standardized--Individual

B. Specific Skills Tests:

Phonic Knowledge
Auditory Discrimination

Step II Construct a Battery for Related Factor Assessment.

Since reading skill does not develop in an individual in isolation, researchers have determined that other factors must be taken into account in the assessment of reading disability, particularly with regard to the implications for mediation or treatment strategies to be used by the teacher or clinician. Therefore, from the following list of related factors and their assessment instruments, a diagnostic test battery is being assembled. This battery will include, when complete, portions of tests, certain items or item types and/or new constructions.

Intelligence
Personality
Emotional Status
Psycho-Linguistic Cominance
Directionality
Neurological Status
Vision
Hearing
Socio-Economic Cultural Considerations
Medical History
Family History

Step III Program Diagnostic Reading and Related Test Batteries for a Computer Storage and Retrieval System.

After selection of the test battery was completed, each test and its items was programmed. The computer is being programmed to respond to "distinctive test profiles" of pupils as recorded in the diagnostic test data. These "profiles" will be combinations of performance characteristics on the test data which have been identified in the previous reading clinic studies and research studies in reading as having implications for treatment procedures. This step will become in effect, the analytic and prescriptive step usually performed by the reading specialist or clinician. The computer, therefore, is being proposed as the instrument to take over this function. Ultimately, the success of this project will largely be determined by whether the computer can be taught to be as sensitive as the clinician to the data which it is given.

Step IV Program Treatment Variables--Strategies, Techniques and Procedures in the Computer Storage and Retrieval System.

Insofar as is possible, the variety of treatment (teaching) procedures used in remedial reading will be programmed in the computer. The strategy is to provide a particular treatment for each diagnostic test or test constellation.

In addition, the computer will be provided with descriptions of teaching techniques to be used when particular diagnostic indicators appear. The computer will be fed data which will enable it to recommend a particular level of beginning instruction by difficulty of the material used for instruction.

Step V Program Reading Materials by Type, Subject and Level in the Computer Storage and Retrieval System.

Readability studies have been done on about 7,000 books and materials used in remedial reading. This information (including title, author, publisher, date, interest level, reading difficulty level, and subject) will be programmed so that it can be retrieved and used prescriptively in the application phase.

Step VI Interface the Computer Storage and Retrieval Systems Diagnostic Test Battery Treatment Procedures and the Information Pool on Materials

In this step, the three separate sections of the computer's information pool will be linked together so that incoming diagnostic data can be translated into profiles, which in turn generate prescriptive teaching procedures and a materials list. This is, in effect, what a skilled reading clinician or specialist does in the diagnostic process. The extent to which the computer can be employed to take over this function and perform it satisfactorily will determine the extent to which this project will be successful.

PHASE II PROJECTION (YEAR 2)-PRELIMINARY TESTING OF THE SYSTEM

Step I Administer diagnostic test battery to randomly selected pupils to find out if the system discriminates pupils with reading problems from those who don't have reading problems.

Step II Process diagnostic data on pupils who have reading disabilities.

Step III Obtain the computer's prescriptive print-out data.

Step IV Test the validity of the computer's recommendations for treatment and materials by carrying out the prescriptive treatment protocols with pupils to determine whether their reading problem is corrected.

Step V Compare the computer-generated strategies, techniques, procedures and materials prescriptions with those independently done by reading clinicians.

PHASE III PROJECTION (YEAR 3)-FIELD TEST THE SYSTEM

Step I Select field sites.

Step II Identify cooperating teachers, classrooms and pupils.

Step III Implement the diagnostic process.

Step IV Process the diagnostic data via computer and secure the prescriptive print-out data generated by the computer plus the materials recommended.

Step V Carry out the computer-generated treatment recommendations.

Step VI Obtain feedback on the system's utility from teachers utilizing the services.

IV Objectives:

1. Select tests comprising the reading diagnostic battery.
2. Intensive orientation for computer systems designer on the reading diagnostic test battery.
3. Develop the general classification scheme for the reading diagnostic test battery.
4. Generate a computer program to output the 8,000 possible diagnostic test patterns for visual examination by the Project 8 staff.
5. Design the diagnostic component of the computer systems.
6. Determine the general classification scheme by which

decisions as to pass-fail, strong performance-weak performance, etc., are made concerning the diagnostic test battery.

7. Develop general system specifications for the feasibility study of the system.
8. Sub-contract to do the detailed computer system design documentation, in order to complete steps 4 thru 7 above.
9. Evaluate various remote terminals and made recommendations for purchase.

V. Project Outcomes

A. Test Battery

The following tests and performance criteria have been established for computer system design and design documentation:

BATTERY OF READING TESTS	PERFORMANCE CRITERIA						
	DESCRIPTIVE					DICHOTOMOUS	
	VERY STRONG	STRONG	AVERAGE	WEAK	VERY WEAK	PASS OR FAIL	
READING PROGRESS	X	X	X	X	X		
LISTENING COMPREHENSION	X	X	X	X	X		
WORD RECOGNITION	X	X	X	X	X		
VISUAL DISCRIMINATION						X	X
AUDITORY DISCRIMINATION						X	X
PHONIC CONSONANTS						X	X
PHONIC BLENDS						X	X
PHONIC DIGRAPHS						X	X
PHONIC VOWELS						X	X

B. Decisions on Specifications for Diagnostic Computer Program.

1. The computer program must accommodate every possible combination of above values of tests for the complete battery (approximately 8,000 combinations of test results).

2. The computer program must accommodate input of test results as specified above from remote terminals in accordance with the standard format designed for such input data.

3. The computer program must be designed to classify each set of diagnostic data received. Classification of each array of test scores must be completed in accordance with data regarding chronological age, mental age and IQ of the pupil tested.

4. The computer program must be designed to match the observed and inputted pattern of test scores with the one among the 8,000 possible patterns of such scores in the computer data bank.

5. Once matched, the computer must identify and print out the English language diagnostic statement which has been prepared and filed in the computer data bank explaining the results and interrelationships, from the clinical point of view, which characterizes that particular test pattern.

6. The computer program must then print out the diagnostic statement described above on the remote terminal from which the input data was originally received.

7. For the initial design of the computer program, it has been decided that the specifications will limit the grade level of pupils handled by this service from between ending second grade to ending sixth grade.

8. For purposes of identifying the most frequently recurring diagnostic test patterns, thereby enabling the investigators to prepare English language texts to be printed out in response to those inputted

patterns, field tests using the tests outlined in (1) above are being conducted as follows:

a. One hundred pupils between third and sixth grades known to have reading problems are being tested with the test battery. Patterns of test results are being identified and English language tests are being prepared for the computer file and for pattern matching purposes.

b. One hundred randomly selected pupils between third and sixth grade of unknown reading competence are being tested with the test battery. Patterns of test results are being identified and English language tests are being prepared for the computer file for pattern matching purposes.

c. The reading test battery has been selected for programming.

d. All possible combinations of test values have been generated through computer programs and have been visually scanned.

e. The detailed computer system design and design documentation have been completed. This computer system design and design documentation are available for review.

f. A remote terminal has been recommended for purchase. It is the Porta Com PC 811.

g. Seventy-five of the 200 pupils have been administered the test battery in the field test. Test patterns generated by these tests have been identified and English language texts describing the diagnostic test results are being prepared. These English language tests will be added to the computer data file for pattern matching and printout purposes.

VI. Conclusions:

A. Computer programming in accordance with the computer system design and design documentation must be started. From date of commencement of programming it is estimated that three months will be required to complete programming.

B. When programming is completed as described above, field test cases (200) should be fed into the remote terminal. The systems will be de-bugged insofar as the computer's classification, pattern-matching and print-out programs are involved.

C. English language tests whould be prepared for each new pattern of test results observed to occur in field testing.

CONFERENCE OF STATE AND REGIONAL EDUCATION OFFICIALS
Project 1

DEMONSTRATION SCHOOL PROJECT DEVELOPMENT
Project 2

VOCATIONAL MATERIALS PREPARATION
Project 3

PREPARATION OF CURRICULAR MATERIALS FOR TRAINING OF VOCATIONAL-TECHNICAL TEACHERS
Project 4

MEDIA INSTITUTE MATERIALS PREPARATION
Project 5

CONFERENCE ON EVALUATION MODEL
Project 6

SELF-INSTRUCTIONAL CAREER GUIDANCE SYSTEM MODEL
Project 7

READING CENTER DEVELOPMENT
Project 8